OFFICE OF COMMUNICATIONS

Authorisation of terrestrial mobile networks complementary to 2 GHz mobile satellite systems

Consultation

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Contents

Section 1

Summary

1.1 This consultation considers the licensing arrangements that should be applied to base stations associated with Complementary Ground Components (CGC) operating as integral parts of 2 GHz mobile satellite systems.

1.2 The European Commission has adopted a Decision that designates the frequency bands 1980-2010 and 2170-2200 MHz to mobile satellite services including those which operate complementary ground components as an integral part. The Decision requires that Member States make the spectrum available for such use including granting applications for operation of CGC systems. A separate EC Decision is being prepared which will establish a pan-European process for the selection and authorisation of mobile satellite systems operating at these frequencies. This Decision is expected to be in place by the first half of 2008 and the selection process itself concluded by the first quarter 2009.

1.3 Some of the prospective MSS operators are considering whether to include CGC within their system designs and have requested an early indication of the regulatory framework for implementing CGC in the UK. As a terrestrial use of spectrum, the use of CGC within the UK will require authorisation under the Wireless Telegraphy Act 2006, and in accordance with European law.

1.4 This document considers options for the authorisation of CGC in the UK. In sum, it proposes that:

- Applications for authorisation of CGC base stations may only be submitted by those MSS operators selected under the EC administered selection and authorisation process.
- Licences for CGC will therefore be awarded by an administrative assignment to those MSS operators.
- Applications for grant of a CGC licence may not be submitted until completion of the EC administered selection and authorisation process.
- However, the CGC may be brought into operation in the UK before launch and operation of the associated satellite network, within a time period to be specified by us.
- Licences awarded for CGC should be technology and service neutral and be tradable, and should not contain any coverage requirements.
- The terms and conditions of the CGC licence will need to be consistent with any obligations arising from relevant EC Decisions. In particular, the duration of the CGC licence should be consistent with the duration of the selection under the pan-European process.
- We should apply Administered Incentive Pricing (AIP) to licences awarded for CGC in order to encourage efficient use of spectrum.

  We should set AIP at a level consistent with current rates of AIP for other comparable bands around 2GHz. We consider the relevant benchmark rates to

be in the region of £554,000-713,000 per 2x1MHz, and propose a rate of around £554,000 per 2x1MHz.

Section 2

Introduction

The purpose of this document

2.1 This document consults on Ofcom's proposals for the authorisation regime to apply in the UK to terrestrial mobile networks, known as "Complementary Ground Components (CGC)", which will support mobile satellite service (MSS) systems operating in the frequency bands 1980-2010 MHz and 2170-2200 MHz ("the 2GHz MSS bands"). CGCs are a way for terrestrial networks to use spectrum also used by mobile satellite systems without causing or suffering interference. They do this as explained later in this document by interleaving with the satellite component's pattern of frequency use. They thus represent a way of exploiting spectrum more efficiently to deliver additional services to citizens and consumers.

2.2 The frequency bands in question were designated for use by MSS, including those systems incorporating CGC, as a result of EC Decision 2007/98/EC. A separate Decision under Article 95 of the Treaty[1] is expected to be adopted by the European Parliament and the Council during the first half of 2008. The MSS operators that will have access to this spectrum will be selected on a pan-European basis through a selection process to be run by the European Commission in accordance with that Decision. However, national administrations will remain responsible for authorising the use of the bands within their territories.

2.3 Ofcom seeks the views of all stakeholders as to the most appropriate method for authorising the use of the 2 GHz MSS bands in the UK. We propose to award licences that authorise the use of this spectrum for transmissions originating from base stations in the UK. We propose to exempt handsets served by the CGC from the need for individual licensing as is the case at present for other terrestrial mobile networks.

2.4 This consultation considers the options for licensing CGC base stations and options for the timing and process of the award as well as the conditions attached to the licence and basis for charging for the licences.

2.5 Following the outcome of this consultation, Ofcom expects to make the necessary regulations to implement the new regime as soon as the technical standards and parameters that will need to be included in the regulations have been determined by the relevant ITU and European Standards bodies.

The structure of this document

The rest of this document is arranged as follows:

- Section 3 – The spectrum management context
- Section 4 – 2 GHz Mobile Satellite Services incorporating Complementary Ground Component (CGC)

[1] http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/com/com_2007_480_en_fin.pdf

- Section 5 – Regulatory Status of Mobile Satellite Service and Complementary Ground Component
- Section 6 – Options for authorising 2 GHz MSS
- Section 7 – Licensing in the 2 GHz MSS spectrum
- Section 8 - Options for CGC licence fees
- Annexes 1 to 3 - Ofcom's consultation principles and how to respond to this consultation
- Annex 4 - Consultation questions
- Annex 5 – Regulatory Impact Assessment (RIA)
- Annex 6 – Glossary
- Annex 7 - References

Section 3

The spectrum management context

Radio spectrum is a valuable and finite resource

3.1 Radio spectrum is a limited resource of considerable economic and social importance. Access to spectrum is key to innovation and competition in the fast-growing information and communications technology sector as well as to a wide range of other commercial and non-commercial applications, including defence, safety-of-life and emergency services and science. Wireless technology is increasing in importance to meet rising demand for communication and entertainment while on the move. The importance of radio spectrum can be gauged from the fact that it has been estimated that its use underpins 3% of UK GDP and generates benefits worth over £40bn a year, a figure that has grown by about 50% in real terms since 2002 and is likely to be an underestimate as it does not take into account the use of spectrum for commercial aviation, public safety, defence or science purposes.

3.2 Spectrum below 15 GHz is usually regarded as constituting the most useful and valuable part of the radio spectrum as its propagation characteristics mean that it can be used for a wide range of applications, including mobile communications at frequencies below about 3 GHz, while providing sufficient bandwidth for broadband services over sufficient distances to make it commercially feasible to roll out national networks. Demand for spectrum at these frequencies is growing and it is critical for innovation and growth that they are used as efficiently as possible.

Ofcom's duties and functions

3.3 This section provides a brief overview of the main UK and European legislative provisions relevant to wireless telegraphy licensing and to the proposed award process. It does not provide a comprehensive statement of all legal provisions which may be relevant to Ofcom's functions and to the award of a wireless telegraphy licence.

Ofcom's general duties

3.4 Under section 3(1) of the Communications Act 2003 it is the principal duty of Ofcom in carrying out its functions:

a) to further the interests of citizens in relation to communications matters; and

b) to further the interests of consumers in relevant markets, where appropriate by promoting competition.

3.5 In doing so, Ofcom is required to secure (under section 3(2)):

a) the optimal use for wireless telegraphy of the electro-magnetic spectrum;

b) the availability throughout the UK of a wide range of services;

c) the availability throughout the UK of a wide range of TV and radio services which (taken as a whole) are both of high quality and calculated to appeal to a variety of tastes and interests;

d) the maintenance of a sufficient plurality of providers of different television and radio services;

e) the application in the case of all television and radio services of standards that provide adequate protection to members of the public from the inclusion of offensive and harmful material, unfair treatment in programmes and unwarranted infringement of privacy;

3.6 and to have regard to certain matters which include:

a) principles of better regulation (section 3(3));

b) the desirability of promoting competition (section 3(4));

c) the desirability of encouraging investment and innovation (section 3(4)(d));

d) the desirability of encouraging availability and use of broadband services throughout the UK (section 3(4)(e));

e) the different needs and interests of persons in different parts of the UK (section 3(4)).

3.7 The management of the UK radio spectrum is governed by the European Communications Directives, which aim to harmonise the regulation of electronic communications networks and services throughout the European Union. Section 4 of the Communications Act 2003 requires Ofcom when carrying out its spectrum functions to act in accordance with the "six community requirements" set out in that section when managing the wireless spectrum in the UK. Of relevance are the following:

a) The requirement to promote competition (section 4(3));

b) The requirement to secure that Ofcom's activities contribute to the development of the European internal market (section 4(4));

c) The requirement to promote the interests of all persons who are citizens of the European Union (section 4(5));

d) The requirement to act in a technology neutral way (section 4(6));

e) The requirement to encourage to such extent as appropriate the provision of network access and service interoperability (section 4(7)); and

f) The requirement to encourage such compliance with international standards as is necessary for (a) facilitating service interoperability; and (b) securing freedom of choice for the customers of communications providers (sections 4(9) and (10)).

Ofcom's duties when carrying out spectrum functions

3.8 In carrying out its spectrum functions it is the duty of Ofcom (under section 3 of the Wireless Telegraphy Act 2006) to have regard in particular to:

a) the extent to which the spectrum is available for use or further use, for wireless telegraphy;

b) the demand for use of that spectrum for wireless telegraphy; and

c) the demand that is likely to arise in future for the use of that spectrum for wireless telegraphy.

3.9 It is also the duty of Ofcom to have regard, in particular, to the desirability of promoting:

a) the efficient management and use of the spectrum for wireless telegraphy;

b) the economic and other benefits that may arise from the use of wireless telegraphy;

c) the development of innovative services; and

d) competition in the provision of electronic communications services.

3.10 Where it appears to Ofcom that any of its duties in section 3 of the Wireless Telegraphy Act 2006 conflict with one or more of its general duties under sections 3 to 6 of the Communications Act 2003, priority must be given to its duties under those sections.

Granting wireless telegraphy licences

3.11 Ofcom's legal power to grant wireless telegraphy licences is set out in section 8(1) the Wireless Telegraphy Act 2006. Section 8(1) makes it an offence for any person to establish or use any station for wireless telegraphy or to install or use any apparatus for wireless telegraphy except under and in accordance with a licence granted by Ofcom under that section (a wireless telegraphy licence).

3.12 Section 9(1) of the Wireless Telegraphy Act 2006 gives Ofcom the power to grant wireless telegraphy licences subject to such terms as Ofcom thinks fit.

3.13 However, Ofcom's broad discretion in relation to the terms that can be imposed in a wireless telegraphy licence is subject to the rule that Ofcom must impose only those terms that it is satisfied are objectively justifiable in relation to the networks and services to which they relate, not unduly discriminatory, and proportionate and transparent as to what they are intended to achieve (section 9(7)).

3.14 This obligation mirrors obligations imposed by Article 9 of the Directive 2002/21/EC (the "Framework Directive") which provides that the allocation and assignment of radio frequencies by national regulatory authorities must be based on objective, transparent, non-discriminatory and proportionate criteria.

3.15 Under Article 5(2) of the Directive on the authorisation of electronic communications networks and services 2002/20/EC (the "Authorisation Directive"), when granting rights of use of radio frequencies (wireless telegraphy licences in the UK context), Member States must do so through open, transparent and non-discriminatory procedures.

3.16 Under Article 7(2) of the Authorisation Directive where the number of rights of use of radio frequencies needs to be limited, Member States' selection criteria must be objective, transparent, non-discriminatory and proportionate. (Section 29 of the Wireless Telegraphy Act 2006 requires Ofcom to make an order setting out the criteria).

Charging fees for wireless telegraphy licences

3.17 Section 12 of the Wireless Telegraphy Act 2006 provides that a person to whom a wireless telegraphy licence is granted must pay to Ofcom such sums as Ofcom may prescribe by regulations.

3.18 Section 13 of the Wireless Telegraphy Act 2006 Act provides that Ofcom may, if it thinks fit in light (in particular) of the matters to which it must have regard under section 3 of the Act prescribe sums greater than those necessary to recover costs incurred in connection with its radio spectrum functions. Charges imposed using this power are referred to as Administered Incentive Pricing ("AIP"). "Prescribe" is defined as meaning prescribe by regulations or determine in accordance with regulations.

3.19 The UK statutory provisions implement Article 13 of the Authorisation Directive, which also provides that Member States must ensure that any fees imposed to ensure the optimal use of the resources must be objectively justified, transparent, non-discriminatory and proportionate in relation to their intended purpose. Ofcom must take these requirements into account when it prescribes licence fees and take into account also the objectives set out in Article 8 (Policy objectives and regulatory principles) of the Framework Directive.

Trading of wireless telegraphy licences

3.20 Articles 9(3) and (4) of the Framework Directive allow for spectrum trading to occur in Member States, subject to the need to ensure that:

- competition is not distorted as a result of any trade; and
- the use of spectrum harmonised under Community measures does not change.

3.21 In the UK, section 30 of the Wireless Telegraphy Act 2006 gives Ofcom the ability to authorise the holder of a wireless telegraphy licence to transfer the rights and obligations that arise under that licence to another person. Such transfers must be made in accordance with regulations made by Ofcom.

Section 4

2 GHz Mobile Satellite Services incorporating Complementary Ground Component (CGC)

Introduction to satellite services

4.1 Satellite systems have been used for more than forty years to provide various forms of one-way and two-way communications services across wide areas. The majority of these systems operate with satellites in the geostationary satellite orbit (GSO) where each satellite is positioned approximately 36000 km above the equator at a longitude that best provides the desired coverage and connectivity.

4.2 As technology has improved and bandwidth requirements have increased, satellites have moved to operate at higher frequencies. Systems providing high capacity point to point communications and some broadcasting applications operate at frequencies around 4/6, 11/14 and 18/30 GHz, whereas systems for mobile applications such as ships, aircraft or even handheld communications typically operate between 1 and 3 GHz.

4.3 One common characteristic of satellite systems, which becomes increasingly important at the higher frequencies, is that unobstructed line of sight is needed between the user and the satellite (See Figure 1).

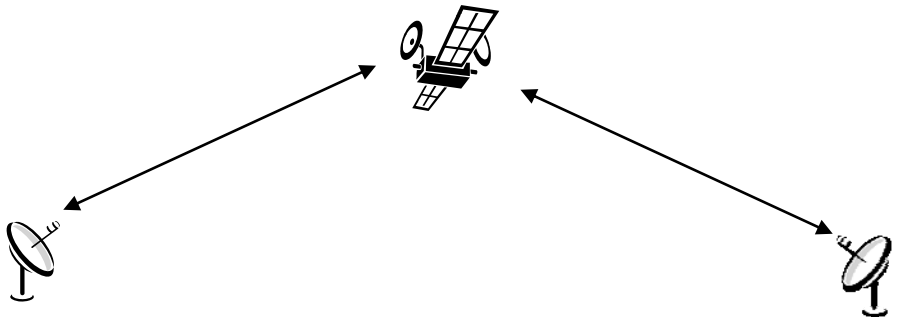

Figure 1 Line of sight required for satellite communications

Mobile satellite systems

4.4 Mobile satellite systems have been deployed for commercial applications since the mid 1970s with some systems designed for global coverage and others focussing on a single geographic region. Global coverage systems using geostationary orbit (GSO) satellites typically use three or four orbital locations to provide complete coverage of the Earth up to latitudes of around 75 degrees. Alternative approaches to global coverage use a constellation of satellites in a low (600-2000 km) orbit, known as a Low Earth Orbit (LEO), or a smaller number of satellites in a Medium Earth Orbit (MEO).

4.5 These lower orbit satellite constellations are referred to as non-geostationary satellite (n-GSO) networks and have a number of advantages over the geostationary systems including, in particular, lower latency and lower signal losses due to shorter

distances. On the negative side, because the satellites operate at much lower altitudes, they can spend considerable amounts of time where there is little or no traffic within the coverage area of individual satellites.

4.6 Most of the existing mobile satellite systems, either GSO or n-GSO, provide a range of low to medium rate digital services including voice, video and data services. Applications are very diverse and include:

- Two way voice and data communications to ships, aircraft and remote and rural areas
- Mobile and transportable contribution links for broadcasters
- Supervisory, control and data acquisition (SCADA) systems for use by utility industry industries (oil and gas) as well as for pollution monitoring and disaster mitigation
- Backup and emergency communications in the event of a disaster

4.7 Mobile satellite systems are interconnected to public networks via one or more earth stations, often referred to as gateway stations. These stations typically operate in the frequency bands allocated to the fixed satellite service.

4.8 User terminals for early MSS systems were large and heavy (50 kg for a typical maritime terminal) but advances in satellite technology mean that it is now possible to support two-way voice communications with hand held terminals. Data rates up to around 500 kbit/s can also be supported with terminals no larger than lap top computers.

MSS and Complementary Ground Components

4.9 MSS systems normally support small user terminals with low discrimination antennas. As a consequence, it is difficult if not impossible, for one MSS system to share the same frequencies in the same geographic area either with another MSS system or with another radio service. Studies carried out in the ITU have concluded that sharing between terrestrial mobile services and mobile satellite services is not possible unless both are under the control of the same frequency management system.

4.10 Some MSS operators have, over recent years, petitioned regulators, particularly in the US, to allow them to deploy such terrestrial networks utilising the same frequency bands as assigned to the MSS operator. This was agreed in principle by the Federal Communications Commission (FCC) in the US, in 2001, where such terrestrial networks are termed Ancillary Terrestrial Communications (ATC) in the USA.

4.11 In Europe, similar representations have resulted in the adoption of various CEPT and EC Decisions (see section 4) that permit the use of certain frequencies assigned to MSS operators for terrestrial overlay applications known as Complementary Ground Components (CGC).

4.12 These CGC will have a number of benefits. For example, they will enable MSS operators to increase the efficiency of use of the spectrum and improve their service capability in areas which are hard to serve by satellite, including built-up urban environments, and to provide in-building service.

4.13 Services that have been proposed to take advantage of the use of CGC to extend the coverage of MSS systems include maintenance of essential communications in the event of disruption or overload of terrestrial mobile systems, often referred to as Public Protection and Disaster Relief (PPDR).

4.14 In addition, the 2 GHz MSS spectrum has been identified as a candidate band for mobile TV using a combination of satellite and terrestrial delivery.

Complementary Ground Component base stations

4.15 In Europe, CGC base stations are considered to be an integral part of a mobile satellite service and it will be necessary for frequencies used by the CGC network to be managed by the same system that is used to control the use of frequencies in the associated MSS system.

4.16 CGC base stations will need to operate within the same block of spectrum assigned to the associated MSS system. However in any single geographic area it is probable that this spectrum will be segmented between satellite use and terrestrial use. This could be achieved either on a pre-determined basis (which could be updated as required) or by using a real time, dynamic channel assignment system.

4.17 A CGC system will likely resemble a 2 GHz mobile system utilising a number of base stations to provide connectivity within major urban areas. Indeed, it may be possible to modify existing 3G mobile service base stations (using 2.1GHz) to accommodate the CGC application without major cost implications.

4.18 Connection between the CGC base stations and the public networks could either be via the MSS system or via some other system including fibre, fixed links or a separate satellite link. Possible configurations are shown in Figure 2.

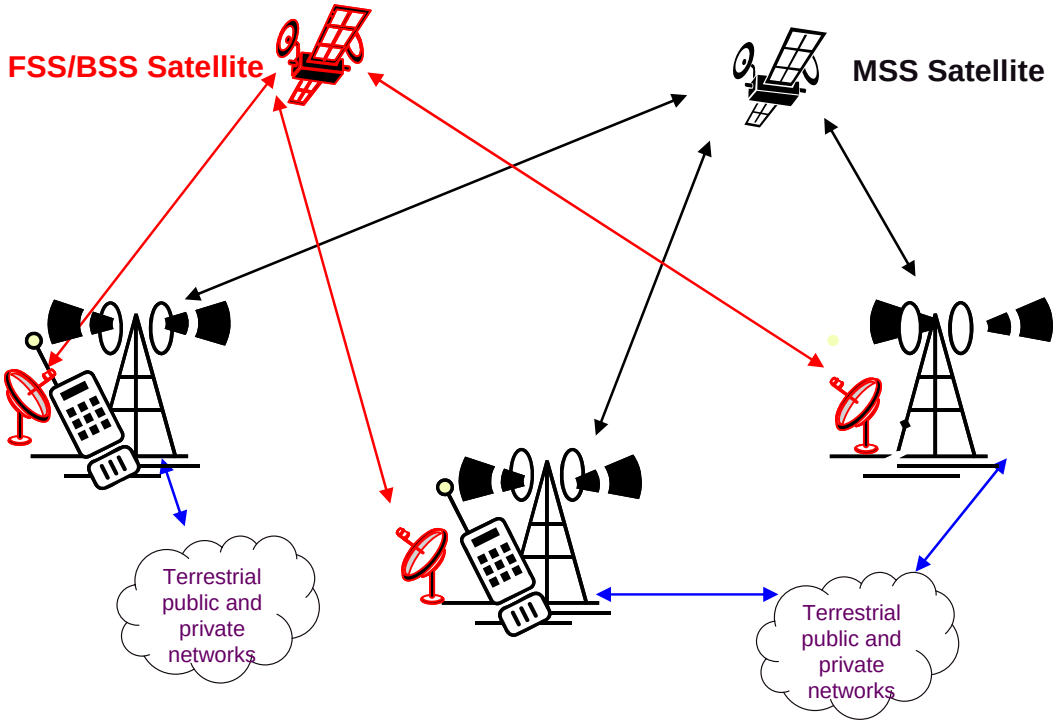

Figure 2 Options for CGC

MSS and CGC user handsets

4.19 MSS handsets are anticipated to be similar to those used in existing MSS systems and therefore similar to typical terrestrial handsets, although slightly larger. CGC handsets are anticipated to be able to work interchangeably between the MSS satellite and the CGC base stations, possibly roaming to the strongest signal in a similar way to a standard cellular mobile network. Ofcom also understand from prospective MSS operators that some intend for the CGC handsets to be dual-mode with terrestrial 3G services.

4.20 Depending on the services and applications that a MSS operator provides they may also develop specialist handsets and accessories which are designed for some specific niche services e.g. ruggedised handsets for use by military personnel or cradles for installation on boats or cars.

Section 5

Regulatory Status of Mobile Satellite Service and Complementary Ground Component

Introduction

5.1 The regulation and use of spectrum in the UK is influenced to varying degrees by agreements and decisions adopted by the European Union, CEPT and the ITU. The nature of the obligations arising from such instruments varies considerably.

- In general terms, Decisions adopted by the Electronic Communications Committee (ECC) of the CEPT are not binding on individual member countries. Where they are implemented by a CEPT administration, the method of implementation is normally notified to the European Radiocommunications Office (ERO) and the relevant information included on the ERO website.

- The ITU Radio Regulations have the force of an international treaty and, subject to any overriding obligations arising from EC Decisions or Directives, impose binding obligations on the UK with regard to the protection of authorised services of other nation states. However, individual states have the right to use spectrum in a manner that is not consistent with the Radio Regulations provided that such use does not cause interference into networks of other administrations which are operating in accordance with the regulations.

- Decisions and Directives adopted by the European Commission and/or the European Parliament and Council are legally binding on the UK.

ITU Allocation status of Mobile Satellite Service

5.2 The Mobile Satellite Service (MSS) is defined in the ITU Radio Regulations as:

> "A Radiocommunication service:
>
> > Between mobile earth stations and one or more space stations, or between space stations used by this service; or
> >
> > Between mobile earth stations by means of one or more space stations'
> >
> > This service may also include feeder links necessary for its operation."

5.3 There is no ITU definition of the terms Complementary Ground Component (CGC) or Ancillary Terrestrial Component (ATC) as used in the USA (see section 4.10).

5.4 MSS is itself a generic definition which encompasses three sector services – land mobile satellite, maritime mobile satellite and aeronautical mobile satellite services. Frequency allocations to the MSS are contained in Article 5 of the ITU Radio Regulations and these are essentially replicated in the European Common Allocation

Table[2], and the UK Frequency Allocation Table[3]. The most commonly used frequency allocations for MSS are within the range 1 to 3 GHz as shown in the following table

Frequency range MHz	Earth to space	Space to Earth	Allocation status
1518 - 1525		x	Primary
1525 - 1559		x	Primary
1610 – 1626.5	X		Primary
1613.8-1626.5		x	Secondary
1626.5 – 1660.5	X		Primary
1668 – 1675	X		Primary
1980 – 2010	X		Primary
2170 – 2200		x	Primary
2483.5 – 2500		x	Primary

5.5 Each allocation is subject to specific sharing environments and other constraints as indicated in the Radio Regulations.

5.6 Numerous MSS systems operate within parts of these frequency allocations providing either regional or global coverage with services including basic voice and data services, broadband internet access, video contribution, data messaging and maritime and aeronautical distress and safety communications. By far the largest number of systems operate within the 1.5/1.6 GHz frequency bands which first came into commercial operation in the mid 1970s. Two systems currently operate using the 1.6/2.4 GHz bands, Globalstar and Iridium.

5.7 For the 2 GHz MSS bands, a more complete description of the allocation status is shown in the following extract from Article 5 of the Radio regulations.

Allocation to services		
Region 1	Region 2	Region 3
1 980-2 010 MHz	FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F	
2 170-2 200 MHz	FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F 5.392A	

[2] The European Table of Frequency allocations and utilisations in the frequency range 9 KHz to 1000 GHz.
[3] United Kingdom Frequency Allocation Table, 2007 Issue No 14.

CEPT Authorisation framework for 2 GHz MSS

5.8 In the mid-1990s, the CEPT administrations recognised the need for a regulatory mechanism to help manage access to the 2 GHz MSS bands, and a series of ERC Decisions was adopted. One of the key Decisions, ERC/DEC/(97)03[4] established a milestone review process for MSS systems with the intention that these services would to be brought into commercial operation in Europe by 31 December 2000. The milestone criteria that were required to be met by that date were:

1. Submission of ITU Advance Publication and Co-ordination Documents
2. Satellite manufacturing
3. Completion of the Critical Design Review
4. Satellite launch agreement
5. Gateway Earth Stations
6. Launch of satellites
7. Frequency co-ordination
8. Provision of satellite service within CEPT

5.9 None of the 5 candidate 2 GHz MSS systems complied with the complete set of milestones by 31 December 2000 and the only satellite successfully launched in these frequency bands was by ICO in June 2001. This satellite was intended to be the first of a constellation of medium earth orbit (MEO) satellites needed to provide global continuous coverage.

5.10 In 2004, several MSS operators indicated a renewed interest in operating satellite systems in the 2 GHz MSS bands. At its 7th meeting, held in March 2004, the CEPT Electronic Communications Committee (ECC) decided to establish a project team (joint project team MSS 2 GHz) to conduct a *"review of the MSS framework in the 1980-2010 MHz and 2170-2200 MHz frequency bands"*. This project team (which subsequently became known as ECC project team PT10) completed its work in January 2007 and developed a draft ECC Decision[5] on the designation of the bands 1980-2010 MHz and 2170-2200 MHz for use by systems in the Mobile-Satellite Service. At this point it also decided to add an opportunity for these systems to be supplemented by a Complementary Ground Component (CGC). This Decision was adopted by the ECC in December 2006 but has not been implemented by the UK.

5.11 The Decision includes, inter alia:

i) that the frequency bands 1980-2010 MHz (Earth-to-space) and 2170-2200 MHz (space-to-Earth) are designated for systems of the Mobile-satellite service;

ii) that these mobile satellite systems may incorporate a Complementary Ground Component (CGC);

iii) that, for the purpose of this ECC Decision, CGC is defined as follows:

[4] ERC Decision of 30 June 1997 on the Harmonised Use of Spectrum for Satellite Personal Communication Services (S-PCS) operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz, 1980-2010 MHz and 2170-2200 MHz

[5] ECC/DEC/(06)09 ECC Decision of 1 December 2006 on the designation of the bands 1980-2010 MHz and 2170-2200 MHz for use by systems in the Mobile-Satellite Service including those supplemented by a Complementary Ground Component (CGC)

> CGC is an integral part of a mobile satellite system and consists of ground based stations used at fixed locations to improve the availability of the mobile satellite system in zones where the communications with one or several space stations cannot be ensured with the required quality. CGC uses the same portions of the Mobile-satellite service frequency bands (1980-2010 / 2170-2200 MHz) as authorised for the associated space station(s).

5.12 This Decision, in common with all ECC Decisions, is open for adoption by CEPT countries, but is not binding.

European Union Framework for Selection and Authorisation of 2 GHz MSS with CGC

5.13 In October 2005, EU Member States recognised the need for a robust legal framework for the selection and authorisation of MSS operators wishing to access the relevant 2 GHz MSS spectrum. The EC Radio Spectrum Committee (RSC) and Communications Committee (COCOM) established an ad hoc group on 2 GHz MSS regulatory issues. The Decision covering the 2 GHz MSS bands was approved by the RSC at its meeting in December 2006 and subsequently adopted[6] on 14 February 2007.

5.14 The justification for an EC harmonised approach to the use of this spectrum was that a fragmented approach would negate the potential benefits of MSS systems intended to provide pan European coverage and would make the use of the available spectrum ineffective.

5.15 The key elements of this Decision, which are binding on EU Member States, are:

> *Article 1*
>
> The purpose of this Decision is to harmonise the conditions for the availability and efficient use of the frequency bands 1 980 to 2 010 MHz (earth-to-space) and 2 170 to 2 200 MHz (space-to- earth) for systems providing mobile satellite services in the Community.
>
> *Article 2*
>
> For the purposes of this Decision, 'systems providing mobile satellite services' are systems capable of providing radiocommunications services between a mobile earth station and one or more space stations, or between mobile earth stations by means of one or more space stations, or between a mobile earth station and one or more complementary ground based stations used at fixed locations.
>
> *Article 3*
>
> Member States shall designate and make available as from 1 July 2007 the frequency bands 1 980 to 2 010 MHz and 2 170 to 2 200 MHz for systems providing mobile satellite services.
>
> Any other use of these bands shall not cause harmful interference to systems providing mobile satellite services and may not claim

[6] **2007/98/EC**, Commission Decision of 14 February 2007 on the harmonised use of radio spectrum in the 2 GHz frequency bands for the implementation of systems providing mobile satellite services.

protection from harmful interference caused by systems providing mobile satellite services.

Any complementary ground based station shall constitute an integral part of the mobile satellite system and shall be controlled by the satellite resource and network management system. It shall use the same direction of transmission and the same portions of frequency bands as the associated satellite components and shall not increase the spectrum requirement of its associated mobile satellite system.

5.16 In parallel with the development of the RSC Decision, the ad hoc group, recognising that spectrum scarcity was highly possible based on a survey by CEPT[7], in which 13 systems were identified with an intention to operate in the 2 GHz MSS band, started development of the necessary legal framework to support the proposed selection and authorisation process. Responsibility for this task was formally transferred to the Communications Committee (COCOM) and in particular to a newly established Working Group on Authorisation and Rights of Use.

5.17 The ad hoc group considered a variety options for the selection mechanisms including selection based on:

a) competitive bids (auctions);

b) a beauty contest; and

c) a milestone review process (MRP).

The UK's preference would have been for an approach based on use of auctions with a high level of flexibility as to future use of the spectrum. However, a number of Member States were not willing to consider an auction model. We therefore concluded on this occasion that it would not be helpful to the process if we insisted on this approach.

5.18 The ad hoc group proposed a combination of the options b) and c) in the form of a comparative selection procedure (beauty contest) between candidates pre-selected through a milestone review process (MRP).

5.19 The EC issued a public consultation on 30 March 2007[8], with a deadline of 30 May for responses, on the proposed selection and authorisation process which also provided specific detail on the evaluation criteria and milestone definitions. This EC consultation sought responses on a number of specific questions related to the manner in which the proposed selection process should be implemented and the nature of the proposed selection criteria.

5.20 It was further proposed in this consultation document that a Decision under Article 95 of the European Treaty would be required in order to provide the level of legal and regulatory certainty to potential operators to make the required investments. Such a Decision would require formal adoption by the European Council and the European Parliament.

[7] ECC (06)097 Annex 14, reflecting the situation as of July 2006.

[8] Consultation document: Selection and Authorisation of Systems Providing Mobile Satellite Services (MSS) http://ec.europa.eu/information_society/policy/radio_spectrum/ongoing_consult/2ghz_mss_30march07_30may07/index_en.htm

5.21 A total of 32 responses were received which can be found at http://ec.europa.eu/information_society/policy/radio_spectrum/ongoing_consult/2ghz_mss_comments/index_en.htm

5.22 In August 2007, the EC published a proposal for an Article 95 Decision[9] on the selection and authorisation process for 2 GHz MSS systems. The purpose of the Decision is to create a Community procedure for the common selection of operators of mobile satellite systems as well as to lay down provisions for the coordinated authorisation by Member States of the selected operators to use spectrum for the operation of MSS.

5.23 The Article 95 Decision is currently under review within the European Council Transport, Telecommunications and Energy (TTE) Working Party and the Committee for Industry, Research and Energy (ITRE) of the European Parliament. Final adoption of the Decision requires approval under the co-decision process.

5.24 Other major provisions of the Decision require that operators of MSS systems and, where appropriate, CGCs, will be authorised by Member States and that no authorisations should be granted before the selection procedure has been completed.

5.25 The proposal will be considered by the European Parliament and the Council and it is expected that the earliest date by which the Decision would be adopted would be April 2008.

5.26 The EC has issued a tentative schedule for the selection and authorisation process with the following major milestones:

Issue of call for applications	June 2008
Submission of applications	September 2008
Publication of Decision:	
(no spectrum scarcity)	January 2009
(spectrum scarcity)	March 2009

[9] Proposal for a Decision of the European Parliament and of the Council on the selection and authorisation of systems providing mobile satellite services (MSS), 22 August 2007

Section 6

Options for authorising 2 GHz MSS

6.1 The outcome of the EC selection and authorisation process will be the identification of the successful satellite operators and their associated spectrum assignments, which will be valid for both the operation of the satellite and the CGC.

6.2 In accordance with the anticipated Article 95 Decision, Member States will be required to authorise use of the resulting assignments in accordance with their national regulations.

6.3 The elements of the MSS systems which could be considered for authorisation by a Member State are:

- Space segment
- Gateway and TT&C earth station(s)
- User handsets
- CGC base stations

Authorisation of Space Segment

6.4 The UK legislation on spectrum authorisation, the WT Act, applies to the installation and use of radio equipment in the UK or on UK-registered ships and aircraft but does not extend to space stations. Accordingly, there is no legal need or basis for Ofcom to authorise the space stations located on board satellites associated with CGCs. However, authorisation of the earth stations, as outlined below, will include a condition that they should operate only with satellites that have been subject to ITU frequency coordination. This is in accordance with Ofcom's general policy on satellite networks as set out at: http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/satellite/procedure_manuals/spectrum_filings/.

Authorisation of Gateway Earth Station

6.5 Any equipment, including an earth station, which has a transmission capability and which is located in the UK is subject to authorisation under the WT Act. There are two routes to authorisation: individual licensing and exemption. Ofcom is required by section 8 of the WT Act to exempt equipment that is unlikely to cause harmful interference. Gateway earth stations contain relatively high-power transmitters that are likely to give rise to harmful interference to other earth stations and other services unless individually planned and coordinated. Ofcom therefore proposes to require CGC gateway earth stations to be licensed. In this respect, they are no different from other earth stations covered by Ofcom's standard Permanent Earth Station licence and could be included in this licence class without any need to develop a new licence product.

6.6 Details of the specific terms and conditions for licensing of these earth stations may be found on Ofcom's website at: http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/satellite/procedure_manuals/PermanentEarthStation.pdf .

Authorisation of Mobile Earth Station and CGC user handsets

6.7 In accordance with current UK practice and in order to minimise the regulatory burden on our stakeholders, mobile earth stations operating in the frequency range 1 to 3 GHz are typically granted exemption from individual licensing through inclusion in the Exemption Regulations[10].

6.8 Exemptions are based on the requirement that each mobile earth station type has characteristics consistent with a relevant European harmonised standard, which are included in the relevant UK Interface Requirement document. Mobile earth stations covered by the Exemption Regulations operate on a non-interference, non-protected basis.

6.9 In order for Ofcom to be in a position to exempt the MSS handsets, we would therefore expect a European standard to have been developed and adopted within ETSI and to be available for inclusion in the public consultation on the proposed exemption regulations.

6.10 For terrestrial cellular networks, handsets that comply with appropriate Interface Requirements are exempted from the requirement for individual licensing when communicating with a licensed network, subject to the terms and provisions of the Exemption Regulations. Where the CGC component is granted a licence by Ofcom, a similar mechanism could therefore be used to effect the exemption of CGC handsets.

6.11 We consider that the exemption of handsets using the 2GHz MSS bands in conjunction with the CGC base stations is likely to be in the interest of consumers by facilitating their access to equipment for mobile use and by facilitating roaming of mobile stations from other countries.

6.12 We also consider that it would be a disproportionate and unnecessary regulatory burden for Ofcom to require individual licensing of handsets. The operation of the CGC handsets will be controlled through the CGC network in a similar way as cellular handsets are controlled by cellular networks. It is therefore envisaged that CGC handsets (or the CGC element where handsets are integrated with a Mobile Earth Station) should also be exempted.

6.13 Details of current provisions for licence exemption are contained in http://www.opsi.gov.uk/si/si2003/20030074 (as amended) and Ofcom's Interface Requirements http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req.

Authorisation of CGC Base Stations/Repeaters

6.14 It is expected that the CGC base stations and repeaters will operate in a variety of ways: either as effectively a separate terrestrial network, with only minimal integration with the MSS satellite; or in such a way as to extend service to MSS customers that are unable to receive service directly from the associated satellite network. The services and/or content provided may be identical to those provided through the satellite network or may be distinct from these.

6.15 It has been suggested by a number of UK stakeholders that a harmonised European approach to the authorisation of CGC as well as the MSS could provide significant

[10] Statutory Instrument 2003 No. 74 The Wireless Telegraphy (Exemption) Regulations 2003 http://www.opsi.gov.uk/SI/si2003/20030074.htm

benefits to the successful candidates in the 2 GHz MSS selection process. In particular, it has been suggested that such a harmonised approach would enable the MSS operator to gain access to the CGC spectrum under the same conditions in all EU Member States and would therefore reduce the regulatory uncertainty which may still exist following the EC selection and authorisation process. A harmonised approach might also, in principle, allow a faster authorisation of CGC across the EU, as an MSS operator would be required to complete a single application form.

6.16 Whilst it can be argued that such an approach could bring some benefits, in practice, a harmonised approach would be very time consuming to develop due to the differences in approach to authorisations of satellites and mobile networks between the Member States. Indeed some Member States, including the UK, do not authorise space stations and have no legal mechanism to do so.

6.17 Therefore, in order to facilitate the speedy entry into operation of the spectrum, Ofcom and the other EU administrations intend to authorise the satellites and CGC on an individual Member State basis, which may include specific national conditions as required by national law.

Award process

6.18 Ofcom's usual practice to secure optimal use of the radio spectrum would be to award licences through a competitive procedure (auction) on a technology and application neutral basis. However, in view of the regulatory framework created by the EC Decisions Ofcom does not consider that this would be feasible. The European selection and authorisation process for 2 GHz MS systems limits Ofcom's options for CGC licensing to award by administrative assignment as the spectrum will be assigned in the European selection and authorisation process to specific MSS operators (including for use in CGC).

6.19 Moreover, authorisation of spectrum rights of use is a Member State responsibility and there is no legal mechanism for such authorisation to undertake at a pan-European level. Ofcom therefore proposes to award CGC licences by administrative assignment, authorising use of the frequency bands for CGC base station operation.

Section 7

Licensing in the 2 GHz MSS spectrum

7.1 Ofcom proposes to develop the MSS CGC licence product in the form of a spectrum access licence incorporating the standard terms and conditions set out in the general Conditions for Wireless Telegraphy licences[11].

7.2 These conditions will include specific technical requirements to permit coexistence with other MSS/CGC systems operating within the designated MSS spectrum as well as systems operating in adjacent frequency bands.

7.3 The terms and conditions attached to the CGC spectrum access licence will need to be consistent with any obligations arising from relevant EC Decisions.

7.4 For 2 GHz CGC the use of the frequency is assigned by the EC process on an EU-wide basis. Ofcom therefore proposes to offer the CGC licences on a UK-wide basis. We consider that a UK-wide approach better reflects the largely national structure of markets for mobile communications, and avoids imposing additional potential costs associated with creating geographic boundaries in spectrum use. It should also be recognised that the MSS operator will still have the ability to re-structure the licence on a regional basis if this provides benefits to them.

Question 1: Do you agree that the CGC licence should be in the form of a spectrum access licence with standard terms and conditions?

Question 2: Do you agree that such licences should be awarded on a UK-wide basis?

7.5 Ofcom understands that the EC process will lead to a specific assignment of frequency to each of the successful MSS operators, which they will have full discretion to assign between the satellite and CGC component. It is therefore intended that the CGC licence be granted for the complete set of frequencies assigned to an MSS operator within this process, to recognise the flexibility that an MSS operator has to develop its networks and services within this assignment.

7.6 If an MSS operator is successful in being assigned, for example, 15MHz of spectrum within the EC process, and applies for a UK CGC licence, it will be authorised across the full 15MHz of spectrum and will therefore pay any CGC fees applicable, based on the full 15MHz of spectrum, irrespective of its planned or actual usage of the spectrum for CGC. In the event that the MSS operator decides not to request a CGC licence then no fees would be payable.

Question 3: Do you agree that the CGC licence should authorise the complete set of frequencies assigned under the EC process?

[11] Wireless Telegraphy General Licence Conditions Booklet
http://www.ofcom.org.uk/radiocomms/ifi/wtf/#WTGLCBl

Award of licence

7.7 The Article 95 Decision being developed by the European Parliament and the Council will mandate Member States to authorise the successful MSS operators to use the assigned spectrum for operation of CGC. Ofcom intends therefore to accept applications for the CGC licences from these successful MSS operators only.

Question 4: Do you agree that the initial grant of the CGC licence should made be to the MSS operator only?

Timing of the award of licence and permitted operation

7.8 There are three aspects to consider:

- should Ofcom license the CGC in advance of the EC selection and authorisation procedure?
- should the CGC be licensed before the satellite component of the MSS system is operational?
- what criteria should Ofcom apply to determine whether the MSS is operational?

7.9 With regard to the timing of licence grant relative to the EC award, some potential operators have argued that the CGC licence should be awarded in advance of the completion of the EC selection and authorisation process. However, this is precluded within the proposed Article 95 Decision which indicates that Member States shall not select or authorise operators of CGC before the EC selection procedure has been completed.

7.10 Ofcom recognises the risk that such an authorisation may not subsequently prove to be consistent with the result of the EC selection and authorisation process and that this would give rise to the necessity to revoke an authorisation after a very short period of time. Of particular, concern to Ofcom in this regard is the impact this revocation would have on UK consumers who would have their service terminated within a brief period of purchasing it.

7.11 A more robust approach would appear to be to award CGC licences at the end of the EC selection and authorisation process when there will be certainty over which satellite systems will be authorised and which frequencies are assigned to each. This approach is also strongly advocated in the Article 95 Decision adopted by the Commission.

7.12 With regard to the timing of the licence to permit operation of the CGC network before the entry into operation of the corresponding satellite network, some EU Member States have indicated that they are not prepared to do this given the risk of the satellite system failing to be deployed. Ofcom is of the view that it should be willing to consider authorisation of CGC networks in advance of the planned date for bringing the satellite service into operation, as long as evidence of binding contracts is available to support the implementation schedule provided, as part of the EC selection process, within the candidate's business plan.

7.13 This raises the further issue of the criteria to be applied to determine whether the satellite network is in fact operational. For this purpose, Ofcom proposes to define the satellite service as being in operation once **all** of the following have been achieved:

- the full constellation of satellites has been launched, commissioned and put into commercial operation in the UK;
- the Gateway earth stations have been commissioned and brought into commercial use;
- user terminals have been manufactured and are available for sale in the UK.

Question 5: Subject to certain safeguards, would it be appropriate to license the CGC in advance of the satellite service coming into operation and if so, what criteria should be applied to determine whether the satellite component of the MSS network is operational and what period of time do you consider would be appropriate?

Term of Licence

7.14 Ofcom's current policy for the term of terrestrial licences which are awarded by administrative assignment is that the licence shall continue in force until revoked by Ofcom or surrendered by the Licensee. For licences that are tradable, a period of not less than 5 years would typically be given in the event of revocation. This provides the licensee with the regulatory certainty which it needs, whilst still affording the flexibility for Ofcom to revoke or vary the licence for spectrum management reasons.

7.15 However, the proposed Article 95 Decision includes a requirement for a set of harmonised conditions in the national CGC authorisations. Ofcom understands that the period of the licence term will be included within the proposed EC Decision detailing the outcome of the selection and authorisation process. The Commission has not as yet indicated what this term will be, although Ofcom understands that it will be linked to the expected lifetime of the satellites and could therefore be expected to be around 15 – 20 years.

Network roll-out

7.16 Ofcom is aware that some Member States are considering the inclusion of network roll-out obligations within the CGC licence, due to their specific national conditions. In the past, some UK licences have included specific network roll-out conditions for public wireless networks, which have either been defined in terms of geographic or population coverage. However, implementing CGC (or not) will be at the discretion of the satellite operators. Moreover, Ofcom's stated policy is generally to leave considerations of technology, service and coverage to operators as far as possible. We therefore propose not to include roll-out obligations within the CGC network licence.

Question 6: Do you agree that the CGC licence should not include a coverage obligation?

Other conditions of use

7.17 The EC selection and authorisation process will select the successful MSS operators to use the 2 GHz MSS spectrum. It would therefore appear unnecessary for Ofcom to impose through the UK authorisation process any particular form of commercial arrangements between the successful MSS operators and entities able to provide CGC.

7.18 The CGC licences will need to reflect the requirements of the Article 95 Decision, as summarised in paragraph 5.15.

Rights of use of the licence

7.19 We propose to provide the CGC licence on a service and technology neutral basis, as far as possible within the constraints of the EC Decisions, in keeping with our overall policy. As such it will be necessary to define the rights of use of the licence in terms of spectrum user rights, rather than prescribing any specific technology and European standard.

Question 7: Do you agree that the CGC licence should be provided on a service and technology neutral basis?

7.20 These rights of use will need to be developed further but are anticipated to include technical factors including the band edge limitations, permitted spectral mask, maximum levels of out of band interference, maximum spurious emissions. These will reflect the relevant standards and recommendations.

Trading

7.21 It is Ofcom's normal policy that spectrum that it awards should be tradable. Trading makes it possible for spectrum to be placed in the hands of those who value it most highly and can generate the greatest benefits from its use.

7.22 We propose that the CGC licence should be tradable. In making the CGC licence tradable, whilst ensuring the obligations arising from the EC process continue to be placed on any operator to whom the licence is transferred, Ofcom wishes to offer the MSS operators the maximum level of flexibility to facilitate any commercial arrangements it wishes with third-party(ies) whilst ensuring that the UK meets its obligations under the EC Article 95 and subsequent Selection Decision. To maximise flexibility, Ofcom proposes to permit total and partial transfers and outright or concurrent transfers. For example, not only would the CGC operator be free to trade the licence in totality to a third party, it would also have the ability to conduct a concurrent trade of part of the geographical coverage of the licence, which would make it possible for the CGC licence to be divided to create regional services. The service would not be permitted to run as a stand-alone mobile network and would still have to provide a CGC service in conjunction with the satellite service.

7.23 As in the existing trading regulations for other licence classes that have been made tradable, it is proposed that transfers would require Ofcom's consent but the matters that Ofcom would be able to take into account in deciding whether or not to withhold consent would be narrowly defined to comprise:

- whether the holder or concurrent holders are in breach of their licence obligations;
- whether the transferee will be able to meet the terms, provisions and limitations of the licence;
- whether the transferee will be able to meet any criteria relating to persons to whom the licence may be held;
- national security, compliance with international or EU obligations or compliance with a direction of the Secretary of State.

Question 8: Do you agree that it CGC licences should be tradable and, if so, that they should be both totally or partially tradable and both outright or concurrently

tradable, that Ofcom's consent should be required for transfers and that the grounds on which Ofcom may withhold consent should be limited as proposed?

Liberalisation

7.24 We propose that the licence for CGC base stations should be granted on a service and technology neutral basis, as discussed in section 7.19.

Licence variation and revocation

7.25 WT licences usually provide for variation or revocation only in certain defined circumstances, such as for a breach of the terms of the licence of for complying with a Community/international measure or with a direction from the Secretary of State. Any proposal to vary or revoke would, in any case, be required to be reasonable and proportionate.

7.26 Ofcom therefore proposes to include in the CGC licence additional revocation clauses to be able to recover the spectrum in the event of:

- The revocation of the EC satellite authorisation for the MSS system for which the CGC relates;
- The failure of the operational satellite and the absence of an operational replacement associated with the CGC within 18 months.

General Authorisation of Telecommunications Networks

7.27 In order to provide electronic communications services (ECS) in the UK, it is necessary for network operators to comply with a general authorisation regime comprising General Conditions of Entitlement (that is, conditions which apply to all) and specific conditions (that is, conditions which apply to individuals). CGC falls within the definition of an electronic communications service and so will benefit from, and be subject to the terms and conditions of, this regime. This means that the CGC operator will not need to obtain individual authorisation to provide ECS although it will, as discussed above, be necessary to obtain a WT licence to use spectrum.

7.28 Details of these terms and conditions can be found at: http://www.ofcom.org.uk/telecoms/ioi/g_a_regime

Authorisation of broadcast TV content

7.29 Where the CGC operator intends to provide TV content over the CGC and/or satellite it will further need to ascertain any obligation it might have to apply for a Television Licensable Content Service (TLCS) licence.

7.30 General guidance notes for applicants of Television Licensable Content Service (TLCS) licences are available on Ofcom's web-site: http://ofcom.org.uk/tv/ifi/tvlicensing/guidance_notes_and_apps/tlcs/

7.31 These guidance notes provide an overview of the licensing process, the licensing requirements and the conditions that licensees are subject to, but do not purport to explain all the relevant provisions of the legislation, or give an exhaustive account of the licensing requirements or licence conditions. Applicants should seek their own legal advice for this purpose.

Enforcement Procedures

7.32 Ofcom is provided within the Wireless Act 2006 with powers to enforce terms, provisions or limitations of a wireless telegraphy licence. These would apply to a licensed CGC operator as to other licensees.

7.33 In addition, as a result of the requirements of the Article 95 Decision for Ofcom to monitor the MSS operators' progress against the commitments made in the EC selection process and to provide the Commission with an annual report of this progress, Ofcom proposes to require MSS CGC operators to provide it with an annual progress report and supporting evidence of their progress and to use this to monitor the MSS operators' adherence to any licence conditions of the CGC licence.

Section 8

Options for CGC licence fees

8.1 In section 7 we have considered various options for licensing CGC base stations. In this section we discuss how Ofcom proposes to charge for CGC licences. We summarise below the general principles underlying spectrum charging and discuss whether there are good reasons to depart from AIP in the particular case of CGC.

Principles of spectrum charging

8.2 Ofcom's key statutory duty in the management of spectrum is to secure the optimal use for wireless telegraphy of the electro-magnetic spectrum for the benefit of UK citizens and consumers. Spectrum charging is one of the tools Ofcom uses to help to achieve this objective. It should be stressed that this is not with the objective of maximising the amounts raised from licence fees. In setting spectrum charges, Ofcom is constrained by law to consider only its spectrum management objectives.

8.3 Radio spectrum is a valuable and limited resource for which demand, especially between about 1 and 3 GHz, exceeds or is forecast to exceed, availability[12]. Since the amount of spectrum is finite and its use is exclusionary (except in very few cases where it is possible for many different types of users to share the same spectrum), the use of spectrum for one purpose precludes its use for another purpose. So use of spectrum for one application denies its use to another and so imposes a cost on society equal to the foregone benefits. This is referred to as the 'opportunity cost'. This cost exists irrespective of the existence of external factors which might prevent alternative uses such as those arising from international agreements.

8.4 Setting fees on the basis of the opportunity cost helps ensure that spectrum is used in the way that generates the greatest benefits for society. The rationale for this is that, if spectrum is being used for one application and a higher value application is denied spectrum as a result of that decision, society will be worse off. Imposing a charge that equals the opportunity cost will help ensure that the most valuable applications can access the spectrum and society is better off, assuming absence of externalities.

8.5 The value which can be derived from the use of spectrum will in part be driven by choices of technology and network design. All such decisions should be made in light of the opportunity cost of such use if they are to lead to the socially optimal use of spectrum in the short and long term. Having to pay a licence fee based on opportunity cost is an effective way of ensuring that this cost is taken into account. For this reason, Ofcom's general policy is to set licence fees in a way that reflects the associated opportunity cost.

8.6 Where decisions over spectrum use relate to investment in assets which have a relatively long productive lifetime, opportunity costs signals are more likely to be long term in their effect.

Spectrum pricing set by auction

8.7 In most cases where Ofcom is proposing to award new licences for spectrum, we offer these to the market through an auction. This is because we consider that

[12] www.spectrumaudit.org.uk

auctions are most likely to lead to the allocation of spectrum to the use and users that can obtain the most value for society from the spectrum. Where spectrum licences are awarded after an auction, the licence fees are set by reference to the bids received, and so will more closely reflect the opportunity cost of the spectrum.

8.8 However, in certain cases we will award spectrum otherwise than by auction. For example, when we consider there is evidence that an auction might not lead to the optimal allocation of the spectrum concerned, we will consider whether an alternative award mechanism that is more likely to produce this outcome. Further, some of our spectrum award processes, for example awarding licences for local radio (sound) broadcasting, are subject to specific legislation which limits, or excludes, the use of competitive bidding to select the licensee.

8.9 In the case of the CGC spectrum, as mentioned in Sections 5 and 6, it would serve no useful purpose to award the licences by auction because the EC process will have already selected the MSS operator or operators authorised to provide CGC.

Administered Incentive Pricing

8.10 For cases where auctions are not used, our current practice for fees applied to equipment licences is to apply Administered Incentive Pricing (AIP). This is because, as explained above, charging licence fees based on opportunity cost is likely to contribute to securing optimal use of the radio spectrum. Each case is considered on its merits and, in a few licence classes, we set fees to recover our spectrum management costs or charge no fee.

8.11 Our general approach to AIP was set out in the consultation on the future pricing of spectrum used for terrestrial broadcasting at http://www.ofcom.org.uk/consult/condoc/condocs/futurepricing/.

8.12 At present, the vast majority of spectrum licensees pay either fees set following an auction, or AIP, for their licences. Major Crown users of spectrum, such as MOD, do not hold licences and so are not subject to AIP. Instead they either currently pay, or expect to pay under the Government's commitment to implementing the Cave review of public sector holdings, amounts set by agreement with Ofcom which are designed, like AIP, to reflect opportunity cost and to create incentives for the efficient use of spectrum.

8.13 With respect to some major spectrum users not currently paying auction or AIP fees:

8.13.1 We recently confirmed our intention to introduce AIP for spectrum used for terrestrial digital broadcasting[13] (both television and radio), from the end of 2014;

8.13.2 We plan to consult early in 2008 on detailed proposals to apply AIP (or equivalent) fees to various spectrum bands currently in civil and military aviation and maritime use;

8.14 It is important to understand that Ofcom's primary purpose in applying AIP is not, in general, to achieve any specific short-term change in the use of spectrum. Rather, our aim is to ensure that the holders of spectrum fully recognise the costs that their use imposes on society by holding spectrum (or seeking to acquire additional spectrum), when making decisions.

[13] http://ofcom.org.uk/consult/condocs/futurepricing/statement/

8.15 As in the case for CGC, we recognise that some holders of spectrum are unlikely to be in a position to make rapid changes to their use of spectrum in response to the application of AIP. However, in every case there is scope for the use of spectrum to change in the longer term. The use of AIP is, in our view, justified by the benefits that should materialise in the longer term, as better decisions are made in light of increased awareness and appreciation of the value of spectrum – better decisions that should lead to more efficient use of the spectrum.

8.16 Ofcom also has some evidence of the success of this policy. In the last two years alone, significant amounts of spectrum have been returned to Ofcom for re-assignment, as a more or less direct result of AIP. 28MHz of the more valuable spectrum below 3GHz has been released by public and private sector users in response to AIP, as has 160MHz of the second-tier spectrum in the range 3-10GHz.

8.17 It is not however our aim, when applying AIP, for large amounts of spectrum to be returned to Ofcom in the short term; rather our aim is to ensure that, in the long term and over time, spectrum is being used as efficiently as possible, and is allocated to the most valuable uses, for the benefit of UK citizens and consumers.

8.18 The specific circumstances by which this award arises, namely the EC Selection and Authorisation process explicitly recognises the obligations of national administrations to apply conditions in accordance with national regulations including the setting of licence fees.

8.19 Ofcom's general preferred approach therefore is to apply AIP at a level which will promote efficient use of the spectrum. Whether it would be justified to make an exception for CGC and, if not, what the level of AIP should be applied to CGC is discussed below.

Alternatives to AIP for CGC

No licence fee

8.20 Instead of setting fees under our AIP approach, we could grant the licences free of charge, or to charge only a fee that recovered our administrative costs.

8.21 In assessing whether to make licences free, Ofcom considers whether the benefit to society from having free licences outweighs any costs. One of the costs of not having any price signal is that this removes an incentive for efficient use of the spectrum, with a resulting risk that the provision of services which rely on use of the spectrum may do so in a way that creates a sub-optimal use of overall spectrum resources.

8.22 In this instance, there is spectrum available which could be used to provide similar services as CGC. For instance, mobile TV could potentially be provided within the UHF digital dividend spectrum, at L band (1452-1492 MHz) or at 2.6 GHz all of which will be the subject of auctions. If the 2 GHz CGC spectrum were not subject to AIP, there is a risk that users would face disincentives to use these alternative bands, even if the benefit they might be able to provide from using those bands were higher than could be achieved at 2 GHz. It could therefore incentivise them to use a satellite/CGC based platform for the delivery of their services even if this is not the most efficient means of delivering them.

8.23 A decision to grant licences free of charge, or to charge a fee based only on our administrative costs, could lead to a socially sub-optimal level of services and would therefore lead to lower benefits for UK citizens and Consumers. We believe that the

potential disadvantages of not providing incentives for efficient use of this spectrum are such that we do not propose this option.

Setting the level of licence fee

8.24 Where AIP is applied, it is necessary to consider the rate at which it is set. This involves estimating the associated opportunity cost based of the foregone alternative use.

8.25 In assessing the opportunity cost associated with CGC, Ofcom needs to consider the important question of which is the appropriate alternative use to take into account.

8.26 Reservation of the 2 GHz spectrum for CGC by means of the EC Decisions imposes an opportunity cost on society in the same way as reservation of spectrum by any other means. To date, we have not identified any valid argument that would justify setting the rate of the fee at less than the full opportunity cost irrespective of the method of reservation of spectrum.

8.27 External constraints do not negate or diminish the existence of the opportunity cost; as alternative uses are still denied access. Moreover, the constraint is not permanent. The CEPT regularly reviews its decisions every 3 years and the EU may review and revise its decisions at any time if circumstances change. We are therefore minded to conclude that the correct measure of the opportunity cost is the best alternative use for the spectrum in the absence of the constraint imposed by the EC Decisions.

8.28 On that basis, we believe that the most likely highest value alternative use for the CGC spectrum would be for mobile applications. This is because the frequencies are adjacent to the current frequencies used by mobile network operators for their 2G and 3G applications and hence would provide a suitable substitute.

8.29 Such services can potentially also be provided through other frequency bands including the current 2.1GHz spectrum, the 1800MHz spectrum and L-Band spectrum (1452-1492MHz) and the 2.6 GHz band (2500-2690 MHz). Mobile operators currently pay AIP charges for the 1800MHz spectrum, have paid a price in the auction for the 2.1GHz 3G spectrum and would need to participate in an auction to get access to the L-Band spectrum or 2.6GHz spectrum

8.30 We have also considered a range of other benchmarks for the rate of AIP in comparable bands below 3GHz. The table below sets out current licence fees and equivalent amounts paid by the Crown (e.g. by the Ministry of Defence) for a number of bands.

8.31 This table suggests that a range for the rate of AIP for CGC licences might be £474,000-792,000 per 2x1MHz. However, we consider that the lowest and highest figures in this range might be disregarded, given the better propagation characteristics of frequencies below 1GHz and conversely the poorer characteristics of frequencies used by MOD up to 3.1GHz.

8.32 Overall we consider that the most suitable AIP reference point currently available is probably for the use of spectrum at around 1800 MHz. Given the technical characteristics of the 2 GHz spectrum, it is reasonable to make the assumption that the opportunity cost of spectrum to them in each band would be similar.

8.33 This would point to a rate of £554,400 per 2×1MHz for a UK-wide authorisation. We note that these charges may be subject to review, as are all AIP charges. We expect to review charges periodically, taking into account relevant developments including the outcomes of pending Ofcom awards in neighbouring frequency bands.

Class of licence	***Equivalent AIP rate for a 2 x 1 MHz national channel ****
Public Wireless Networks (2G Cellular Operator) in the 880/0-960.0 MHz band	£712,800
Public Wireless Networks (2G Cellular Operator) in the 1717.0-1880.0 MHz band	£554,400
Business Radio (GSM-R Railway use)	£792,000
Business Radio (Public Wide Area Paging) in the 137-172 MHz, 449-470 MHz or 870-871 MHz	£792,000
Ministry of Defence use of bands in the range 960-1452 MHz	£593,400
Ministry of Defence use of bands in the range 1452-2245 MHz	£554,800
Ministry of Defence use of bands in the range 2245-3100 MHz	£473,800

* Note: The actual AIP rate and reference bandwidths are not the same in all cases – an equivalent AIP rate for a 2 x1 MHz national channel is shown

Question 9: Do you agree that AIP should be applied to CGC licences at a rate that reflects the associated opportunity cost?

Question 10: Do you agree that the licence fees should be set at around £554,000 per 2 x 1MHz?

8.34 We have received representations indicating that setting the level of fees too high may discourage the deployment of CGC, but we have no evidence to support this argument at present.

8.35 In the case of this spectrum, the users who will hold licences are constrained, under the terms of the Commission decision, to providing services complementary to mobile satellite services (i. e. CGC services). In addition to paying AIP, they will need to finance the manufacture, launch and maintenance of an MSS satellite or satellite constellation. They will also need to have been successful in the EC Selection and

Authorisation Process. In the event of spectrum scarcity and a comparative selection process ("beauty contest"), this will place additional specific obligations on the licence holder, in terms of the service geographic coverage, spectrum efficiency and obligations arising from consideration of public interest and consumer benefits. There is also a possibility that a minimum geographical obligation will be placed on MSS operators by the EC process, absent any spectrum scarcity.

8.36 The potential licensees, in considering whether to apply for CGC licences, will therefore consider the business case for supplying these services within the context of their overall business case. Their decision will depend on their expectation of the revenues they can generate from these services, compared with all of the attendant costs, including not only spectrum charges but infrastructure costs and the costs of all other relevant inputs.

8.37 As in all cases where licensees are limited to providing certain services, it is possible that the service itself would not generate sufficient commercial benefits to justify the investment, given the total level of costs.

8.38 In setting spectrum fees, we need to consider the possible impact on commercial operators, and any resulting effects on consumers and citizens. In this case, if the imposition of AIP at the proposed level resulted in decisions by operators not to offer CGC based services in the UK, there would, at least in the short term, be a period during which the spectrum could not be used for alternative applications, or only for a limited range of applications that could operate on the non-interference, non-protected basis mandated by the decision. The spectrum could therefore lie fallow, with a loss to consumers of any benefits from CGC or other uses.

8.39 At present, we have no indications that the likely level of fees would itself lead to operators deciding not to apply for licences and launch services. However, if it seemed likely that the level of fees we were proposing would lead operators not to provide services in this spectrum, we would need to consider the size of the loss to consumers from not having this service.

8.40 In making the CGC licence tradable, we aim to ensure that MSS operators have an opportunity to develop business models for CGC which are as flexible as possible within the constraints of the EC Decisions, which we believe will mitigate this risk

8.41 Any decision to set fees at a different level would need to be justified by robust and detailed evidence about the likely effects of imposing AIP set at the proposed level.

Question 11: If you believe that setting fees at this level would result in CGC systems not being deployed, please provide your reasons and full supporting evidence including a detailed business case.

Annex 1

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 25 March 2007**.

A1.2 Ofcom strongly prefers to receive responses using the online web form at http://www.ofcom.org.uk/consult/condocs/cgcs/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 bob.phillips@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.

Bob Phillips
Floor 3
Space Services Unit
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Fax: 020 7981 3208

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 Bob Phillips on 020 7981 3119

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 statement in April 2008.

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 version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will normally allow ten weeks for responses to consultations on issues of general interest.

A2.6 There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organizations interested in the outcome of our decisions. This individual (who we call the 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. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

After the consultation

A2.8 We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

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 ☐

Whole response ☐

Part of the response ☐

Name/contact details/job title ☐

Organisation ☐

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

A4.1 This annex provides a list of the questions included in this consultation document.

Question 1: Do you agree that the CGC licence should be in the form of a spectrum access licence with standard terms and conditions?

Question 2: Do you agree that such licences should be awarded on a UK-wide basis?

Question 3: Do you agree that the CGC licence should authorise the complete set of frequencies assigned under the EC process?

Question 4: Do you agree that the initial grant of the CGC licence should made be to the MSS operator only?

Question 5: Subject to certain safeguards, would it be appropriate to license the CGC in advance of the satellite service coming into operation and if so, what criteria should be applied to determine whether the satellite component of the MSS network is operational and what period of time do you consider would be appropriate?

Question 6: Do you agree that the CGC licence should not include a coverage obligation?

Question 7: Do you agree that the CGC licence should be provided on a service and technology neutral basis?

Question 8: Do you agree that it CGC licences should be tradable and, if so, that they should be both totally or partially tradable and both outright or concurrently tradable, that Ofcom's consent should be required for transfers and that the grounds on which Ofcom may withhold consent should be limited as proposed?

Question 9: Do you agree that AIP should be applied to CGC licences at a level that reflects the associated opportunity cost?

Question 10: Do you agree that the licence fees should be set at around £554,000 per 2 x 1MHz?

Question 11: If you believe that setting fees at this level would result in CGC systems not being deployed, please provide your reasons and full supporting evidence including a detailed business case.

Annex 5

Impact Assessment

Introduction

A5.1 In accordance with good regulatory practice, where a statutory regulation is proposed, a Regulatory Impact Assessment ("RIA") must be undertaken. The analysis presented here, when read in conjunction with the rest of this document, represents a Regulatory Impact Assessment as defined by section 7 of the Communications Act 2003 ("the Act") for amending the Wireless Telegraphy (Licence Charges) Regulations 2005.

A5.2 You should send any comments on this RIA to Ofcom by the closing date for this consultation. We will consider all comments before deciding whether to implement our proposals.

A5.3 RIAs provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making and are commonly used by other regulators. The requirement to carry out impact assessments is reflected in section 7 of the Act, which stipulates that generally we have to carry out impact assessments where our proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out and publishing impact assessments in relation to the great majority of our policy decisions. For further information about our approach to impact assessments, see the guidelines, Better policy-making: Ofcom's approach to impact assessment, which are on our website: http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf

Background

A5.4 The European Commission has adopted a Decision which designates spectrum at 2 GHz for mobile satellite services including those that wish to deploy a terrestrial component referred to as the Complementary Ground Component (CGC). The latter would operate as an integral part of the MSS and would be managed by the same frequency management system as the satellite. The EC is also developing a Decision for the selection and authorisation of MSS operators, which will require approval by the European Parliament and the Council.

A5.5 The proposed regulatory framework anticipates that authorisation of the operation of the selected MSS networks and where appropriate any CGC base stations would be carried out by the responsible authorities of each Member State.

A5.6 Many of the candidate operators anticipate using the CGC as a central part of their business proposition and we have been requested to provide clarity on how CGC would be authorised in the UK in order that any cost implications can be factored into the business decisions by the operators.

A5.7 Section 12 of the Wireless Telegraphy Act 2006 ("The WT Act") permits the use of spectrum pricing by requiring Ofcom to prescribe in Regulations sums payable for WT Act licences. This power enables Ofcom to recover the cost of administering and managing Wireless Telegraphy Act licences. However, Ofcom also has a range of duties under section 3 of the WT Act which require Ofcom to efficiently manage

the radio spectrum. Consequently, section 13 of the Wireless Telegraphy Act 2006 permits Ofcom to recover sums greater than those it incurs in performing its spectrum management functions in order to provide incentives for spectrum efficiency. This is known as Administered Incentive Pricing (AIP).

Proposal

A5.8 This RIA relates to the consideration of options for the authorisation of terrestrial mobile networks complementary to 2 GHz mobile satellite systems. This includes the nature of any authorisation to be granted, any associated terms and conditions and the level of fees that would be levied for use of the spectrum.

A5.9 Ofcom takes account of the impact of its decisions upon both citizen and consumer interests in the markets it regulates. In proposing a specific licence product for CGC base stations we have considered the wider impact beyond immediate stakeholders in the radiocommunications community. We believe that the proposals will be of benefit to consumers for the following reasons:

i) Early indication of the regulatory framework for authorisation of CGC base stations will provide timely information to potential operators of MSS systems incorporating CGC and therefore increase the likelihood of the introduction of additional services to UK citizens and consumers;

ii) use of AIP will encourage more efficient use of the radio spectrum making more spectrum and potentially more services available to UK citizens and consumers;

iii) simplified licence charges will facilitate fee payment and reduce costs to licensees by reducing the number of transactions;

iv) licence exemption for handsets will facilitate “free circulation” of handsets throughout Europe and will provide roaming opportunities for consumers.

Ofcom’s policy objective

A5.10 Ofcom’s policy objective is to implement its obligations arising from the adoption of the proposed Article 95 Decision and subsequent selection and authorisation Decision so as to secure optimal use of the radio spectrum used by CGC based services. We believe that this will be best achieved by ensuring that users of this spectrum take into account the opportunity cost that their use imposes.

A5.11 The success of this policy will depend on a number of unknown factors, including whether the imposition of licence fees based on the full unconstrained opportunity of mobile services will deter operators from implementing CGC in the UK.

A5.12 The policy objective is a medium to long term one, given that the combination of the Article 95 Decision and the RSC spectrum designation Decision limits the scope for other uses in the short term. However, we believe that in order to achieve this policy objective it is necessary for this action to be taken now, so that the appropriate incentives are in place to ensure rationale decisions can be made by the market.

Options considered

A5.13 The European selection and authorisation process for 2 GHz MSS systems limits Ofcom’s options for CGC licences to award by administrative assignment as the

spectrum will be assigned to specific MSS operators, including for use with CGC and must, therefore, be granted to the MSS operator selected by the EC process.

A5.14 We are of the view that operation of CGC base stations should be subject to a formal licensing process and that the most appropriate option is a spectrum access licence incorporating appropriate terms and conditions.

A5.15 We also propose that the licence should be offered on a UK wide basis and that it should include the entire spectrum assigned to the MSS operator under the EU selection and authorisation process.

A5.16 The options open to Ofcom in relation to the fees charged for WT Act licences generally fall into the following categories:

i) to charge the full rate of AIP

ii) to charge cost recovery prices for WT licences

iii) not to charge for WT Act licences;

A5.17 A light handed regulatory approach is proposed for authorisation of user equipment based on licence exemption for equipment operating in accordance with an appropriate ETSI standard and limited to operation in accordance with the terms and conditions of the CGC authorisation.

Analysis of the options

A5.18 We have provided a detailed description and analysis of the proposed options in Sections 6, 7 and 8 of the document. We believe that the most appropriate option would be a licence product for CGC base stations which would be a spectrum access licence.

A5.19 We have considered three options for licence fees for CGC base stations.

A5.20 A fee based on AIP which reflects the opportunity cost of the spectrum based on alternative uses and therefore would encourage optimal use of the spectrum, particularly in the longer term.

A5.21 We believe that fees based on recovery of administrative costs or those that are zero rated AIP would not encourage optimal use of the 2 GHz spectrum. It could also potentially lead to a distortion of the costs between systems using spectrum subject to market pricing and those that are not. If the 2 GHz CGC spectrum were not subject to AIP, there is a risk that operators would face disincentives to use other bands, even if the benefit they might be able to derive from using those bands were higher than could be achieved at 2 GHz. It could therefore incentivise them to use a satellite/CGC based platform for the delivery of their services even if this is not the most efficient means of delivering them.

A5.22 We further propose that the licence fee should be based on the same opportunity cost as for other networks operating at around1800 MHz and that such licences should be granted and charged on a national basis. Whilst we recognise that RSC Decision limits uses aside from MSS and CGC (other than on a non interference and non protected basis) we believe that this opportunity cost must be signalled to the MSS operators to ensure that the true costs to society are adequately reflected

by the MSS business. We believe this provides the necessary incentives to operators to make efficient use of the spectrum, albeit in the long term.

Benefits

A5.23 A1.22 The proposed authorisation regime provides a simple and effective method to licence the operation of CGC base stations operating in accordance with the proposed Article 95 Decision and the RSC Designation Decision. The proposed licence fees are based on our general principle of setting the fee according to the opportunity cost of the highest value alternative use, with reference to the same or adjacent frequency bands. This approach encourages optimal use of spectrum given the needs of the market for spectrum.

Costs to business

A5.24 The cost of licensing CGC base stations will fall to those MSS operators who plan augmentation of their satellite coverage as a means of improving the service quality, coverage (particularly indoor coverage) and reliability to their customers. The amount to be paid will be in direct proportion to the amount of spectrum denied to other uses and the opportunity cost of that spectrum. Those MSS operators electing not to deploy a CGC network would not be required to pay for use of the spectrum.

A5.25 The approximate annual licence fee for a network of CGC base stations operating within an assigned bandwidth to the MSS operator of 2 times 10 MHz would be £5.5 million. As with all fees Ofcom levies, it anticipated that these fees would be revised on a regular basis to ensure that they continue to reflect the true opportunity cost at in particular time.

A5.26 We have no reason to believe that such a level of fee would have a significant negative impact on the overall business viability of the CGC system. However, we do recognise that it is difficult for us to evaluate this given the flexibility of the authorisation in terms of: the nature of the services which can be provided; and the differing emphasis which operators may place on the role of the CGC in their business model.

Costs to Ofcom

A5.27 There are one-off administrative costs associated with making a Statutory Instrument for a licence product. Additionally, there are recurring costs associated with the processing of the annual licence applications and renewals.

Conclusion

A5.28 For the reasons identified in the preceding paragraphs and described in detail within the consultation, we propose a licence product and associated fee arrangements for CGC base stations using a spectrum access licence and fees established on an AIP basis using the UK public wireless networks operating at 1800 MHz as being representative of the opportunity cost.

Annex 6

Glossary

Administration	Any governmental department or service responsible for discharging the obligations undertaken in the Constitution of the ITU, in the Convention of the ITU and in the Administrative Regulations.
AIP	Administered incentive pricing – setting charges for spectrum holdings to reflect the value of the spectrum in order to promote efficient use of the spectrum.
Allocation	Use of a frequency band. Entry in the table of frequency allocations of a given frequency band for the purpose of its use by one or more terrestrial or space radio communications services or the radio astronomy service under specified conditions. This term is also applied to the frequency band concerned.
Assignment	Use of a radio frequency or radio frequency channel. Authorisation given by an administration for a radio station to use a radio frequency or radio frequency channel under specified conditions.
CEPT	European Conference of Postal and Telecommunications Administrations. A body of national policy-makers and regulators in the telecoms and postal sectors which co-operate on regulatory and technical standardisation issues, including harmonisation within their field of responsibility.
CGC	Complementary Ground Component. A terrestrial network which forms as integral part of a MSS system and uses the same frequencies, in the same direction as the satellite and which does not increase the spectrum demands of the MSS system.
COCOM	Communication Committee of the European Commission. Its members are EU Member States and it assists the Commission in carrying out its executive powers at the top level. It provides a platform for an exchange of information on market developments and regulatory activities.
EC	European Commission. The executive body of the European Union.
ECC	Electronic Communications Committee. One of two committees at the highest level of CEPT which deals with all matters relating to electronic communications.
ERC	European Radiocommunications Committee, a previous committee within CEPT, the responsibilities of which are now undertaken by the ECC.
Exemption	Exemption regulations made by Ofcom allow anyone to use specified radio equipment without the need to have a WT Act licence.
Frequency Band	A defined range of frequencies that may be allocated for a particular radio service, or shared between radio services.

FSS	Fixed Satellite Service. Satellite service which provides communications between fixed earth stations.
Geo-synchronous orbit	A satellite orbit around the earth which is at a distance which results in it orbiting at the same rotational speed and direction as the earth spins on its axis.
GHz	Gigahertz – unit of frequency equal to one thousand MHz.
GSO	Geostationary satellite orbit. A geo-synchronous orbit of the earth, directly above the equator, in which the satellite appears to be stationary when viewed from earth.
Harmonisation	The identification of common frequency bands throughout a region (e.g. Europe) for a particular application and, in some cases, technology.
Hz	Basic unit of frequency – one hertz is equivalent to one cycle per second.
Interference	Unwanted disturbance caused in a radio receiver or other electrical circuit by electromagnetic radiation emitted from an external source.
ITU	International Telecommunication Union - the United Nations agency for information and communication technology responsible for developing and publishing the International Radio Regulations.
JPT	Joint Project Team.
Market mechanisms	Approach to managing spectrum where key decisions, e.g. on acquiring or disposing of spectrum and what service to provide are made by spectrum users rather than by the regulator.
MSS	Mobile Satellite Service. Satellite services made to/from mobile satellite handset and/or fixed earth stations.
MHz	Megahertz – unit of frequency equal to one million Hz.
Ofcom	Office of Communications. Ofcom is the regulator for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services.
Opportunity cost	The cost of a decision or choice in terms of the benefits which would have been received from the most valuable of the alternatives that was foregone.
Outright	(Of spectrum trading) a transaction in which the transferred rights and obligations pass to the transferee and no longer appertain to the transferor.
Partial	(of spectrum trading) a transaction in which some of the rights and obligations are transferred while other are not.
PMSE	Programme Making and Special Events – a class of radio application that supports a wide range of activities in entertainment, broadcasting, news gathering and community events.
Radio Regulations	International Radio Regulations made by the ITU, which have the status and force of a treaty, allocate frequencies globally to various applications and deal with cross-border interference.

Radio spectrum	The portion of the electromagnetic spectrum below 3000 GHz that is used for radiocommunications.
RSC	Radio Spectrum Committee of the EC, made up of EU. administrations and which assists the EC in the adoption of technical implementing measures in support of Community policies.
Satellite	An object which is located in an orbit around a celestial body. In Radiocommunications, a man-made electronic device which receives and transmits signals to and from earth stations on the earths surface.
Spectrum	The range of electromagnetic radio frequencies from LF frequencies to x-rays and gamma rays.
Spectrum liberalisation	Removal of restrictions from WT licences and RSA to allow holders greater flexibility to change how they use spectrum.
Spectrum trading	Ability of spectrum users to transfer rights and obligations under WT licences to another person in accordance with regulations made by Ofcom. Trades may be total, partial, outright or concurrent.
Total	(Of spectrum trading) a transaction in which all the rights and obligations are transferred to the transferee.
UKFAT	UK Frequency Allocation Table. This identifies responsibilities for the management of frequency bands or services showing whether they are managed by Ofcom, the MOD or another Government department or Agency. It also includes the ITU Table of Frequency Allocations contained in the current Radio Regulations. It is published by Ofcom on behalf of the National Frequency Planning Group, a sub-committee of the UKSSC.
UKSSC	Cabinet Office committee that discusses matters relating to the use of the radio spectrum, including by government departments and other public sector bodies.
WRC	A World Radiocommunication Conference, one of the principal activities of the ITU Radiocommunication Sector (ITU-R), is convened normally every three to four years to consider specific radiocommunication matters. A World Radiocommunication Conference deals with those items which are included in its agenda, including the partial or, exceptionally, complete revision of the Radio Regulations.
WT Act	The Wireless Telegraphy Act 2006, which sets out the statutory framework for management of the radio spectrum consolidating a number of older Acts dating back to 1949.
WT licence	Licence granted by Ofcom to authorise installation or use of radio equipment as required by section 8(1) of the WT Act.

Annex 7

References

ECTRA/DEC(97)02 - Harmonisation of authorisation conditions and co-ordination of procedures in the field of Satellite Personal Communications Services (S-PCS) in Europe, operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz, 1980-2010 MHz and 2170-2200 MHz

ERC/DEC(97)03 ERC Decision of 30 June 1997 on the Harmonised Use of Spectrum for Satellite Personal Communication Services (S-PCS) operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz,1980-2010 MHz and 2170-2200 MHz

ERC/DEC(97)04 ERC Decision of 30 June 1997 on transitional arrangements for the Fixed Service and the Mobile-Satellite Service in the bands 1980-2010 MHz and 2170-2200 MHz in order to facilitate the harmonised introduction and development of Satellite Personal Communications Services

ERC/DEC(97)05 ERC Decision of 30 June 1997 on free circulation, use and licensing of Mobile Earth Stations of Satellite Personal Communications Services (S-PCS) operating within the bands 1610-1626.5 MHz, 2483.5-2500 MHz, 1980-2010 MHz and 2170-2200 MHz
ECC/DEC/(06)10 ECC Decision of 1 December 2006 on transitional arrangements for the Fixed Service and tactical radio relay systems in the bands 1980 2010 MHz and 2170 2200 MHz in order to facilitate the harmonised introduction and development of systems in the Mobile Satellite Service including those supplemented by a Complementary Ground Component

ECC/DEC/(06)09 ECC Decision of 1 December 2006 on the designation of the bands 1980-2010 MHz and 2170-2200 MHz for use by systems in the Mobile-Satellite Service including those supplemented by a Complementary Ground Component (CGC)