Commission for
Communications Regulation

Response to Consultation

Response to the Consultation on Mobile Communications on board Aircraft (MCA)

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1 Executive Summary

This document is in response to the consultation on Mobile Communications on board Aircraft (MCA), ComReg 07/62, and it considers the regulatory approach most appropriate to facilitate the use of mobile phone terminals on board commercial aircraft, while ensuring that the existing terrestrial mobile communications systems are not subject to harmful interference.

It should be noted that the operation of any wireless devices on board aircraft and the installation of the MCA systems remain subject to airworthiness certification by the European Aircraft Safety Agency (EASA) and the Irish Aviation Authority (IAA) and as such are beyond ComReg's remit and therefore the scope of this response to consultation.

A précis of the system as proposed and the regulatory approaches undertaken so far in other jurisdictions is outlined at Appendix A of this document. This also includes work undertaken by the European Commission and the European Conference of Postal and Telecommunications Administrations (CEPT[1]).

Issues raised during the consultation, the responses given and ComReg's position, are detailed in Section 4 of this document. Additionally all responses received, where not marked confidential, will be published at www.comreg.ie in due course.

In summary the specific questions posed related to the following areas:

- The potential for interference and suitability of mitigation methods;
- The possibility of any economic impact on Irish Mobile Network Operators (MNOs);
- The legal basis and options for regulating MCA in Ireland, including the following options:

Option A	General Authorisation[2],
Option B	General Authorisation and MCA Radio Licence[3],
Option C	General Authorisation coupled with an Exemption Order for the on Board Equipment or
Option D	Not licensing the system, prohibiting its use, and

- Any other issues.

Section 5 of the document details ComReg's final position including the proposed regulatory framework[4] and the conditions to be attached to authorise MCA services

[1] CEPT was established in 1959 by 19 countries and now comprises 48 member countries throughout Europe. In 1988 ETSI (the European Telecommunications Standards Institute) was created by CEPT to produce telecommunication standards.
[2] See Appendix B
[3] This would be a restricted service licence in the GSM bands, with a specific frequency band of operation and at much lower power than a conventional GSM licence.

on board Irish Registered Aircraft using the General Authorisation for MCA services and an Exemption Order[5] for the on-board wireless telegraphy equipment.

[4] The proposed regime matches that proposed in both the EC recommendation and contains the criteria used in the EC decision on the harmonised use of spectrum for MCA services

[5] See Appendix B

2 Introduction

ComReg's statutory objectives include: a focus on the promotion of competition in terms of increased choice; encouraging interoperability of trans-national services, including contributing to the development of the internal market; and the efficient use and effective management of Irish radio spectrum.

ComReg's proposal for regulating MCA services, as outlined in this response to consultation, is in line with these objectives.

2.1 List of Respondents

There were 6 responses to the Consultation Document 07/62 and ComReg would like to thank these respondents for the time and effort taken in making their responses and for the valuable information provided. All responses received by ComReg except for confidential annexes will be made available on the ComReg website www.comreg.ie.

Respondents:

- **Mr. Eric Keogh**
- **Meteor**
- **On-Air**
- **O2**
- **Vodafone**
- **Mr. Paul Weldon**

3 Consultation Issues

3.1 Description of ComReg's Consultation proposal

The legal basis in Ireland for the provision of networks and services is the Authorisation Regulations, 2003[6]. Under these Regulations, there is a general entitlement to provide electronic communications networks[2] (ECN) or electronic communications services (ECS) subject to compliance with standard conditions set out in a General Authorisation. Before providing networks or services to third parties, operators are required to submit a notification to ComReg, for the purposes of compiling a register of such operators.

Where the operation of an ECN involves spectrum use, an operator must normally obtain an appropriate licence, or use equipment which is exempted from licensing under the appropriate Regulations, in accordance with Section 6 (1) or Section 3 of the Wireless Telegraphy Act 1926, as amended. This also applies to any radio communications apparatus and/or any ECN used on board Irish registered aircraft. In licensing or exempting such services, ComReg must take into account the prevention of interference to existing and planned services, as well as ensuring such processes are carried out in an objective, transparent and proportionate manner.

ComReg is cognisant of the ever increasing demand from consumers to use mobile communications regardless of location. However, to ensure the successful operation of any such system there is a need to establish a regulatory basis both here and internationally to allow its use, while ensuring in this instance that interference to existing terrestrial GSM systems is negligible. The system under consultation allows passengers to use voice, text and data services on board a suitably equipped aircraft.

As mobile phone terminals are already exempt from licensing, it is envisaged that the MCA provider would operate under a General Authorisation and as such there are regulatory issues raised by the use of an ECN in the form of an on-board Base Station (BTS) and Network Control Unit (NCU) and the subsequent provision of an ECS. It should be noted that backhaul over the air-to-ground segment is not for consideration as it will be either authorised under the aircraft's Wireless Telegraphy licence or, in the case of airborne satellite communications, the equipment is already exempt from licensing.

Concerning spectrum rights of use, ComReg considers the legislation in force to be quite clear in this matter, in that the owner of the Radio Spectrum is the Irish State. As the Irish NRA for the Radio Spectrum, ComReg administers the spectrum and licenses particular operators to operate a given radio service on a piece of spectrum for the duration of their licence. The fact that the operator is licensed on a particular piece of spectrum does not imply that operators own the spectrum detailed in their licence, but merely that they have the right of use of that spectrum subject to certain conditions.

[6] European Communities (Electronic Communications Networks and Services)(Authorisation) Regulations 2003 (SI No. 306 of 2003)

There are several licensing regimes which ComReg could consider in authorising and or licensing ECS and ECNs provided on board aircraft and these are detailed below:

Option A	General Authorisation,
Option B	General Authorisation and MCA Radio Licence,
Option C	General Authorisation coupled with an Exemption Order for the on Board Equipment, and
Option D	The final alternative was that of not licensing the service and therefore prohibiting its use entirely in Irish Airspace.

It should be noted that a permanent regulatory framework, such as those proposed in options B and C, requires the MCA system to be fully standardised[7] before appropriate legislation can be written to implement such an approach. Furthermore option C can only be implemented when there is 'negligible risk'[8] of harmful interference and currently under the EU licensing framework ComReg would have had to have extremely strong reasons for adopting Option D. However the adoption of the EC (European Communities) Decision 2008/294/EC is mandatory on member states and therefore this is no longer an option.

3.2 General Views

3.2.1 Views of respondents

Four of the six respondents stated that they were fully in favour of a Pan-European approach to authorising MCA services, on the condition that all of the MCA systems fully meet the requirements of the European Communications Committee (ECC) Decision. Furthermore three of these respondents expressed the view that they considered it important that ComReg continued to participate in international forae to pursue the common approach outlined in the ECC Decision.

Three respondents did not answer any of the specific questions but one of them in their general response expressed its concerns to see the removal of all 'regulatory hurdles' to enable the launch of the services, while accepting the rights of the respective regulators, ComReg and the IAA, to approve such services. The other two respondents were completely against the authorisation of MCA services.

3.2.2 ComReg's position

ComReg notes the general view in favour of MCA services and in proposing to authorise such services can assure respondents that the intention is to do so in a way which is fully consistent with the ECC Decision, the EC Decision and Recommendation 2008/295/EC, inter alia enabling the development of an internal

[7] ETSI EN 302 480

[8] Regulation 9 (1) a and b of the Authorisation Regulations 2006, see Appendix B

market for such services. As such, ComReg will continue its active participation in relevant international forae, such as CoCom and the pertinent ECC working groups as they relate to the further development of MCA services.

3.3 Technical Methodology

Q. 1.	**Do you believe that the technical methodology outlined here is sufficient to prevent interference to Terrestrial Mobile networks? If not, what specific improvements should be made? Note; Respondents should refer to ECC Report 93 prior to answering this question and provide reasons for that answer**

3.3.1 Views of respondents

Four respondents answered this question, with three of them agreeing fully with the findings of ECC Report 93 and the protection methodology outlined in the subsequent ECC Decision (06)/07. Those three respondents also emphasised the need for strict adherence to the Decision.

Another respondent agreed with the theoretical model and approach used but said there was a need for practical tests to be carried out prior to the authorisation of MCA services in any form. The same respondent also said that the operation of the system prior to NCU switch-on needed to be clarified and that any MCA system should comply with the proposed ETSI standard EN 302 480.

3.3.2 ComReg's position

ComReg is satisfied that the Equivalent Isotropically Radiated Power (EIRP) limits contained in the ECC Decision for both Mobile Terminals, the NCU and BTS are sufficient, along with the speed and duration of transit (20 minutes based on an airspeed of 400 knots) across Irish airspace, to ensure that there is 'negligible risk' of harmful interference to the terrestrial services of the MNO. Furthermore, the EIRP produced by the BTS and NCU is akin to that produced by Mobile Terminals which are already exempt from licensing and is around 40dB lower than that produced by a MNO's terrestrial base station (BTS) licensed under the existing Wireless Telegraphy Regulations. ComReg also notes the opinion of one operator who agreed in principle, while commenting that practical tests should be carried out on the service prior to authorisation of MCA services.

ComReg is of the view that compatibility studies carried out by CEPT and reflected in ECC Report 93 and CEPT Report 16, the requirements for use of MCA to comply with the relevant ECC and EC Decisions and ETSI standards, and the fact that airworthiness certification of any equipment installation is required deals adequately with issues of compatibility with terrestrial networks. Furthermore ComReg intends to move to a more permanent regulatory framework, which while being consistent with the ECC, EC Decisions and Recommendation, will include the necessary

operational and technical restrictions under ComReg's jurisdiction for operation of the service with minimal risk of harmful interference.

3.4 Numbering /Roaming Issues

Q. 2.	**Do you agree with ComReg's view that a numbering methodology for a MCA system is not required? If not please give reasons for your answer.**

3.4.1 Views of Respondents

Only four respondents answered this question and agreed with ComReg that there was no need for the national regulator to allocate specific numbers to the service. In particular one respondent (On Air) stated that due to the international nature of the service non-geographic E.164[9] and E.212 numbers had been assigned to two of the existing potential MCA service providers to provide for international roaming and network identification respectively.

3.4.2 ComReg's Position

ComReg is cognisant that some regulators have mooted that specific numbers should be allocated to this service. ComReg's view is that it is completely unnecessary for a national regulator to assign specific individual E.164 telephone numbers within its country code allocation and this was supported by respondents.

3.5 Effects on the Irish Mobile Market

Q. 3.	**Do you agree that the licensing or Authorisation of MCA systems will not have any adverse effect on the market for Irish Mobile Network Operators? If you disagree please justify your argument with appropriate figures or estimates.**

3.5.1 Views of Respondents

Two respondents held the view that the economic impact of MCA would in general be neutral, as subscribers would be making calls in situations where they previously could not. This and the added cost involved in using MCA services would combine to make it unlikely that extensive substitution of voice calls and text messages would take place. Both respondents also pointed to the likelihood of additional call traffic for MNOs who held Roaming Agreements with the provider of MCA services. Furthermore, one of these respondents added that the provision of MCA services was

[9] E.164 is the ITU Recommendation governing regular telephone numbers, such as the Irish mobile ranges 085, 086, 087 etc. (or +353.85 etc. in international format).

likely to *"add significantly to the value of mobile services for consumers by widening the sphere of mobile use into an important area where it is currently precluded"*. However the same respondent went on to underline the fact that existing MNOs were 'primary users of this spectrum' and therefore must have adequate protection for their services, which appears contrary to its earlier acceptance of the EIRP limits contained in the ECC decision, as being sufficient to protect their services from harmful interference.

Another respondent expressed concerns that the work at the EC Communications Committee, including the then draft Recommendation CoCom 07-53, might not fully reflect the technical and regulatory elements of the ECC Decision. The same operator emphasised the need for ComReg to ensure that this is corrected. A further respondent re-iterated its view that the provision of MCA services would cause harmful interference to terrestrial services provided by MNOs.

One other respondent argued that the EU 'Eurotariff' regulation[10] covered Roaming Agreements between MCA operators and terrestrial MNOs and asked for clarification on this issue.

3.5.2 ComReg's Position

Given that no clear evidence was provided by respondents that the business of terrestrial MNOs would be greatly affected, ComReg believes that once MCA services are operated in accordance with the ECC Decision then the net effect of the authorisation of MCA services will either be economically neutral or slightly positive in operation. ComReg believes that MCA services would in practice be a niche rather than a mass market product primarily due to the restricted capacity[11] of satellite backhaul for MCA traffic. To open up the MCA service to more users on an aircraft will require a significant improvement in backhaul capacity. ComReg also understands that most of the Irish MNOs have finalised Roaming Agreements with MCA service providers, underpinning the view that the impact of such services will be more likely economically positive.

Following one respondent's concerns, it can be confirmed, from the EC Recommendation on the authorisation of Mobile Communications Services, that the technical regulatory parameters as detailed in the ECC Decision are incorporated into the EU wide regulatory regime as an annex to the EC Decision. Furthermore, ComReg can confirm that the reference to CEPT Report 16[12], in the 'whereas' section of the document relates to the report from CEPT to the European

[10] See Appendix B

[11] 64-128kb/s

[12] CEPT Report 16: Report from CEPT to the European Commission in response to the EC Mandate on Mobile Communication Services on board aircraft (MCA) (available from www.ero.dk).

Commission on the EC Mandate on Mobile Communications on board Aircraft This report adopts the limits and methodology contained in the ECC Decision which in itself is based on ECC Report 93. ComReg also confirms that the EC Recommendation and the EC Decision also reference the Harmonised European standard.

In terms of the request for clarification of whether the 'Eurotariff' Regulation applies to MCA services. ComReg can confirm that this question was asked of members of the European Commission who stated at a workshop on MCA services at Eurocontrol in Brussels on 3rd of October2007 that the 'Eurotariff' Regulation will not apply to the MCA services. This would appear to be consistent with the likelier greater costs involved in providing this service. What is of vital importance is the provision of appropriate information for intending consumers on the associated costs prior to using the offered service.

3.6 Legal Issues

Q. 4. What are your views on the legal basis outlined here?

3.6.1 Views of Respondents

Five respondents responded in detail to this question and their views are presented below.

Two respondents were of the view that only a General Authorisation was necessary to operate the on board equipment, subject to certain conditions being attached to ensure the avoidance of harmful interference.

One of these respondents expressed the view that if an *"existing authorised operator was to provide MCA services, then no further authorisation would be required"*. Notwithstanding, the same respondent further stated that the ECC Decision needed to be *"solidified by a convention or agreement having standing in law"*. The same respondent made the further point that in its view the MCA operates by way of a "jammer" which effectively raises the noise floor on the receive channels of mobile terminals to block the signal from terrestrial networks', and sought ComReg's clarification as to whether MCA then contravenes Section 12A of the Wireless Telegraphy act as amended. Additionally the respondent observed that it would be the first occasion in Ireland that commercial licences would be issued on the same frequencies as are currently licensed to existing service providers'.

Another respondent expressed the view that there already existed a standard regulatory regime based on the 3G and GSM Regulations issued under the Wireless Telegraphy Act, 1926, which allowed for the issue of GSM licences subject to the conditions of a General Authorisation (as previously outlined in Section 4.1 of this document). This respondent argued that the licensing of MCA services should be carried out in exactly the same manner and should be subject to all of the same conditions as apply to terrestrial MNO licences. The respondent did however qualify

this argument by stating that in its view such arrangements would only apply to services falling under Irish jurisdiction, i.e. in Irish Airspace, but noted that ComReg has the option to exempt a service from licensing where the risk of harmful interference is negligible. Contrary to its response to Question (1), the respondent argued here that it favoured a licensing approach with the 'burden of proof' (that the on board equipment does not interfere with the systems of existing terrestrial MNOs) residing with the operator of the MCA.

A further respondent was in general agreement with the legal basis outlined by ComReg but contrary to views it expressed earlier in its response, favoured a 'licensing' approach (Option B) when responding to this question.

3.6.2 ComReg's Position

ComReg holds that a regulatory regime based solely on a General Authorisation of its own would be insufficient to authorise MCA services where Wireless Telegraphy apparatus such as the NCU and BTS combination is used.

ComReg can also confirm that the incorporation of the limits and methodology by reference into the EU regulatory regime will legally underwrite any regulatory approach adopted and furthermore notes that the EC Decision is mandatory on member states.

ComReg believes that spectrum sharing is an internationally accepted spectrum management tool which can be seen from Article 5 of the ITU Radio Regulations and is a welcome feature of the Irish Radio Spectrum regulatory landscape allowing for a mutually beneficial sharing of spectrum resources.

ComReg would also wish to clarify, contrary to one view expressed, that this would not be the first occasion on which ComReg has licensed spectrum to a new operator on a set of frequencies already used by an existing operator and indeed a spectrum sharing approach is a well founded and well used international methodology for ensuring spectrum efficiency[13]. At the European regional level sharing arrangements for mobile telephony for example are developed by CEPT.

In terms of the usage of the spectrum licensed to the MNOs, ComReg believes that it is useful to revisit the following definitions from the ITU Radio Regulations, which have the status of an International Treaty in Ireland and the GSM and 3G Wireless Telegraphy Regulations, which the MNOs operate under, in Ireland:

'Mobile service' means a radiocommunication service between mobile and land stations;

[13] An example of internal co-channel sharing is in Public Mobile Radio. This is where the same frequency is shared between users using differing access tones and then can be re-used after a certain distance. Internationally there are three basic methods for frequency sharing: international treaties such as the Radio Regulations of the International Telecommunication Union (ITU), collective agreements under the auspices of regional organisations such as CEPT and finally bilateral agreements between sovereign states.

‘Land mobile service’ means a mobile service between base stations and land mobile stations;

‘Land station’ means a station in the mobile service not intended to be used while in motion;

‘Base station’ means a land station in the land mobile service; and

‘Land mobile station’ means a mobile station in the land mobile service capable of surface movement within the geographical limits of a country or continent.

From these definitions and the definitions given in the Wireless Telegraphy (Third Generation and GSM Mobile Telephony Licence) Regulations, 2002, as amended, it is clear that the rights an MNO can validly claim are only those associated with the use of the spectrum to provide a land based service and not rights to the spectrum ad infinitum, regardless of the altitude the service is provided at. Therefore, ComReg believes that as long as the primary service is sufficiently protected from harmful interference there are no legal restrictions to the licensing or otherwise authorising of MCA services.

ComReg also holds that there are two strong reasons why a GSM equivalent licence is not suitable for MCA services:

1. While GSM 1800 technology is used as the means of bi-directional communication in MCA systems, the NCU produces controlling transmissions on other Mobile bands to limit the reception of terrestrial signals by Mobile Terminals and prevent the terminals increasing in power or inhibiting transmission as necessary.

2. As already mentioned at section 4.3.2, the EIRP produced by the BTS and NCU is akin to that produced by Mobile Terminals which are already exempt from licensing and is around 40dB lower than that produced by a MNO’s terrestrial base station (BTS).

In the unlikely event of harmful interference occurring ComReg wishes to emphasise that a standard methodology for reporting such harmful interference is essential. As such ComReg would like to draw to the attention of all interested parties its document ComReg 07/35 [14] which outlines interference reporting procedures.

[14] http://www.comreg.ie/publications/radio_interference_complaint_form.583.102659.p.html

3.7 Licensing Approach

Q. 5.	**In order to prevent interference to terrestrial Mobile networks what is the most appropriate licensing approach based on those detailed above; Option A, B, C or D[15]? Please be specific about the reasoning behind your choice.**

3.7.1 Views of Respondents

Three respondents were of the view that Option B was the most appropriate licensing approach for MCA services. All three claimed that there were two basic points to support this view. Firstly in terms of proportionality and fairness, similar services should be licensed in the same manner. Secondly, all argued that should a MNO experience interference from an MCA operator operating under a licensing scheme, such as that proposed by option B, then the licensing scheme would give ComReg more power to deal with the interference in a more comprehensive manner than the other options outlined[16].

Two respondents strongly argued that MCA services should be forbidden as it constituted an invasion of privacy i.e. Option D.

A single respondent expressed the view that, in general, Option A was the correct approach under which to allow MCA services. However, later in its response, the respondent points out that another option open to ComReg would be to exempt the on-board equipment from licensing under Regulation 9.1 of the Authorisation Regulations, using an Order made under Section 3 of the Wireless Telegraphy Act[17] and for the operator to be authorised under a General Authorisation. This is the same methodology outlined in licensing Option C.

3.7.2 ComReg's Position

While the privacy issues raised are beyond ComReg's remit, ComReg has referred the issue to the IAA who are the appropriate authority to deal with such issues on this occasion. With this in mind ComReg's proposed regulatory regime for the use of MCA services is conditional on the prior and continuing approval of both the IAA and EASA.

[15] The licensing options are described fully in Section 4.1 of this document.

[16] It should also be noted that one of the respondents expressing this view argued to the contrary in its response that if an 'existing authorised operator was to provide MCA services, then no further authorisation would be required' which is the regime presented in Option A

[17] See Appendix B for further details

On balance, and after considering all of the contributions from respondents to all of the questions posed, ComReg has decided to proceed with the facilitation of MCA services as proposed in ComReg document 07/62. Subject to prior and continuing IAA and EASA approval, ComReg intends to permanently authorise MCA systems using a General Authorisation for the MCA operator and an Exemption Order for the on-board BTS and NCU, which is option C.

ComReg's reasoning behind this decision can be summarised as follows;

- Due to the limited power of the on-board equipment and the effective disablement of transmission of non GSM 1800 Mobile Terminals by the NCU, ComReg believes the methodology contained in the ECC Decision will be sufficient to prevent harmful interference.

- MNOs can only claim rights that are associated with the use of the spectrum to provide a land based service.

- Spectrum Sharing is a well founded and well used international strategy for managing the radio spectrum both internally within an administration but also externally between administrations.

- ComReg is of the view that if the MCA services in line with the ECC Decision ECC DEC.(06)/07; then the net effect of the authorisation of MCA services will either be economically neutral or slightly positive in the initial stages of the services' operation.

- Most of the Irish MNOs have signed Roaming Agreements with an MCA provider

- There is already an international standard methodology for reporting harmful interference.

- This approach is fully consistent with both the EC Decision, which is mandatory on member states and the EC Recommendation.

- The introduction of MCA will enhance consumer choice and convenience whilst encouraging interoperability of trans-national services and contributing to the development of the internal market.

3.8 Other Issues

Q. 6.	**In regulating MCA are there other issues not covered in the consultation that should be taken into account? If so please indicate what they are and give reasons?**

3.8.1 Privacy: Views of Respondents

Two respondents held the view that licensing MCA systems was in effect an invasion of privacy.

One respondent also stated that ComReg should specify the responsibilities of MCA system operators with respect to important areas such as data retention, interception and in particular the routing of emergency calls.

3.8.2 ComReg's Position

ComReg notes the views of the respondents on invasion of privacy. However, the privacy issues outlined above are a matter solely for the IAA.

ComReg's view is that under a General Authorisation the MCA operator will be responsible for data retention and if necessary interception in the normal manner. However, due to the nature of the responsibilities of the Aircraft's Captain and Crew for safety issues and safety communications, ComReg believes that the routing of emergency calls is no longer a requirement in this particular case.

4 Next Steps

ComReg has carefully considered the views of the respondents to the questions posed and after examining the EC Decision and Recommendation is proceeding with the facilitation of MCA services as detailed in ComReg document 07/62 subject to the following conditions;

- The authorisation and Exemption Order is only applicable in Irish territory.
- The MCA service operator must obtain all approvals and licences necessary prior to operating within the jurisdiction of other administrations.
- The use of the system must be terminated immediately when it is out of the jurisdiction of the Administration of Ireland other than over international waters or of airspace covered by any reciprocal agreement with any other Administration.
- All operation is conditional on EASA and IAA prior and continuing approval, any subsequent rules; in terms of equipment, in flight operation and the use of mobile terminals (handsets).
- The MCA system may only be used at cruising heights above ground greater than 3000m and operation of the system must be immediately terminated below this level.
- The MCA system on each Aircraft must be fully conformant with ECC Decision ECC/DEC/(06)07 and operation must be immediately terminated should any malfunction or situation occur.
- The Malfunctioning MCA system must be disabled for the remainder of the flight and may not be used again until it is fully certified as being conformant with ECC Decision ECC/DEC/(06)07 and otherwise operating correctly.
- ComReg reserves the right to inspect the aircraft and MCA installation at the MCA service operators own expense prior to and during operation if necessary.

It should be noted that the Exemption Order is conditional on prior and continuing IAA and EASA approval and as such International reciprocity will only be with Administrations[18] who have fully implemented ECC Decision ECC/DEC/(06)07 or can certify that their installations match the conditions contained in that document. Failure to comply with the Exemption Order may lead to prosecution for the possession and use of unlicensed apparatus for Wireless Telegraphy under the Wireless and Telegraphy Act 1926 as amended.

The following steps will be taken to implement the Commission's decision as outlined in Section 5 above:

[18] Belgium, France, Germany, Italy, The Netherlands and Switzerland have already implemented ECC/DEC/(06)07.

- Providers of MCA services on Irish registered commercial aircraft are required to notify ComReg that they intend to provide such services under the Authorisation Regulations.[19]
- Subject to IAA and EASA approval, an Exemption Order for the MCA apparatus on board the aircraft will be drafted.

[19] See Appendix B.

Appendix A: Brief System Description[20]

An MCA system comprises a Base Station (BTS) and Network Control Unit (NCU) on board the aircraft and a radio link, typically via satellite, to a ground station and then to the public telecommunications networks.

The BTS on board the aircraft operates at low power in the GSM 1800 spectrum (1710-1785MHz and 1805-1880MHz) controlled by the NCU. The NCU not only controls the on-board BTS but also instructs all mobile devices on which band to operate on, what power to use and also produces a signal masking mobile terrestrial networks, not only in the GSM 1800 MHz band but also in the 450, 900 MHz and 3G bands. This prevents mobile terminals from receiving any valid network signal, other than from the on-board BTS. In effect this prevents all mobile devices within specification contacting their respective terrestrial networks and, where phones are multi-band, it forces them to operate at minimum power (0dBm) and only on the GSM 1800 band.

Typically communication to and from the NCU and BTS to the terrestrial mobile and fixed networks is handled by satellite, entering the terrestrial networks at a Ground Gateway (GGN) and nearest Main Switching Centre (MSC or Exchange). A simplified system diagram is shown in *Figure 1 (excerpted from ECC Report 93).*

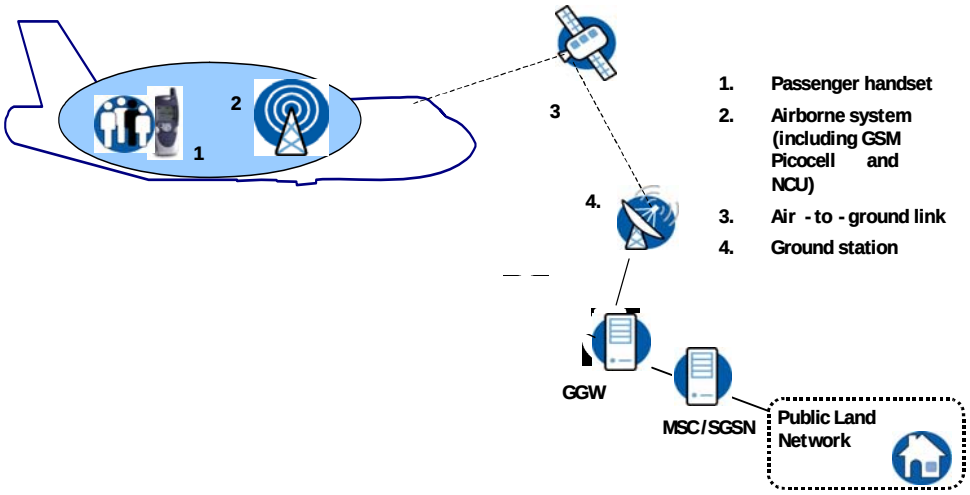

Figure 1: Simplified On Board GSM (MCA) System Diagram

[20] For more technical details regarding the system's operation refer to ECC Report 93 available at www.ero.dk.

4.1 International Developments

4.1.1 Developments in CEPT

Work on MCA was initiated in the CEPT ECC[21] working groups in 2004 and supported by an EC mandate[22] in 2006. This has resulted in two key documents the first of which, ECC Report 93, addresses the compatibility between GSM equipment on board aircraft and terrestrial networks. The report includes the results of compatibility studies based on extensive Monte-Carlo analysis.

The second document issued is an ECC Decision[23], which covers free circulation and the harmonised usage of MCA systems. This document sets the minimum operational altitude and the maximum emissions outside the aircraft hull produced both from the system itself and all of the mobile terminals within the aircraft cabin.

It should be noted that further work on MCA systems is ongoing within the ECC Working Group Spectrum Engineering (WGSE) project team SE7 to examine other frequency bands and in particular the band 2500 – 2690 MHz.

4.1.2 Developments in the European Commission

Following on from the work on MCA at CEPT ECC working groups the European Commission (EC) set about formulating a pan-European regulatory approach led by the Communications Committee (CoCom) and Radio Spectrum Committee (RSCom) to deal with the authorisation and subsequent licensing of such services. This resulted in the Commission Mandate to CEPT of the 12th of October 2006 and the EC Recommendation and subsequent EC Decision on the harmonised conditions for the use of spectrum.

4.1.3 European Telecommunications Standardisation Institute (ETSI) Developments

Following the work at CEPT, ETSI were mandated by the EC to develop a harmonised standard (European Norm (EN))[24] covering the equipment used in MCA systems. The draft standard has currently been submitted for public consultation and the standardisation process is expected to conclude by Q2 2008.

4.1.4 Advances in Other Countries

4.1.4.1 Australia

In April 2007 Australia[25] licensed a single Qantas domestic aircraft as a trial platform for one year. This operates with similar restrictions to the CEPT ECC Decision but

[21] Electronic Communications Committee
[22] EC Mandate on Mobile Communication Services On Board Aircraft (MCA) 12/10/2006
23 ECC/DEC/(06)07 ECC Decision of 1 December 2006 on the harmonised use of airborne GSM systems in the frequency bands 1710-1785 and 1805-1880 MHz
[24] Draft EN 302-480
[25] MR 37/2007, 18/04/2007, Final stage in place to allow a limited evaluation of mobile telephone services on board a commercial aircraft.

also includes the limitation of the service to data and text only (i.e. no voice), no operation at heights below 6000m and is limited to Australian airspace.

4.1.4.2 Belgium

In August 2006 Belgium gave a trial licence to On-Air of Switzerland, with the operational and technical details corresponding to those contained in the CEPT ECC Decision.

4.1.4.3 Finland

Finland have authorised MCA services using the General Authorisation regime.

4.1.4.4 France

France issued a trial licence to Air France in January 2008. Air France decided to initially trial only text messaging services but in April 2008 the service was expanded to include voice services.

4.1.4.5 Germany

Following the issue of a test licence in 2006 and with conditions matching those contained in the ECC Decision. In 2008 Germany decided to permanently authorise MCA systems under a General Authorisation.

4.1.4.6 Netherlands

Following a public consultation The Netherlands decided to permanently authorise MCA systems under a General Authorisation.

4.1.4.7 Norway

In autumn 2005 Norway licensed the use of specified GSM 1800 channels for on board aircraft usage. The licence limits the operation to Norwegian registered aircraft over Norwegian airspace and operation over the high seas (that is operation over non sovereign waters). Operation over other countries is specifically prohibited unless otherwise provided for in the national law of the affected State. Norway also states that its view is that the system and licensing approach must be harmonised internationally for long term success. It should be noted that this license predates the CEPT ECC Decision and is limited to operation at altitudes of 6000m or above.

4.1.4.8 Spain

In spring 2008 and following the EC Recommendation and decision Spain recently issued a trial licence for 100 aircraft regardless of country of registration.

4.1.4.9 Sweden

Sweden have authorised MCA services using the General Authorisation regime.

4.1.4.10 United Kingdom

Ofcom consulted on the issue in April 2006 and issued its response at the end of October 2006[26]. Its conclusions were that Ofcom is committed to a 'Multilateral approach to mobile services on board aircraft' and to the reciprocal recognition of licensing arrangements between participating states. Ofcom held a further consultation late in 2007 and following this has authorised the use of MCA systems; subject to the wireless telegraphy apparatus being included in the Aircraft's Radio Licence and the operator holding a General Authorisation.

4.1.4.11 United States (Federal Communications Commission)

The FCC issued a Notice of Proposed Rulemaking[27] in December 2004. While the FCC received many comments on the proposed rulemaking it found that there was insufficient standard technical data to consider the issue further and terminated the notice on April 3 2007[28]. The FCC has proposed to reconsider the issue if and only if appropriate technical data becomes available.

[26] OFCOM 'Mobile Services on Aircraft, Summary of stakeholder views about the introduction of mobile services on board aircraft'

[27] FCC 04-288A1 Notice of Proposed Rule Making; Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and other Wireless Devices Aboard Airborne Aircraft.

[28] FCC 07-47A1 Memorandum, Opinion and Order; Amendment of the Commission's Rules to Facilitate the Use of Cellular Telephones and Other Wireless Devices Aboard Airborne Aircraft

Appendix B: Relevant Legislation and Other Regulatory Texts

Acts:
Wireless Telegraphy Act 1926, No 45 of 1926

Relevant Sections:
Exemption Orders are made under Section 3 of the Wireless Telegraphy Act 1926,
Regulations are made under Section 6
Prevention of Interference Section 12A

Regulations:
Wireless Telegraphy (Third Party Trial Licence) Regulations 2005, S.I. No. 114 of 2005

Exemption Orders:
Wireless Telegraphy Act 1926, (Section_3) (Exemption_of_Low_Power_Aircraft_Earth_Stations) Order, 2004: S.I. No. 505 of 2004
Wireless Telegraphy Act, 1926 (Section 3) (Exemption of Mobile Telephones)(Amendment) Order, 2003: S.I. No. 158 of 2003,

Wireless Telegraphy Act, 1926 (Section 3) (Exemption of DCS 1800 Mobile Terminals) Order, 1999 (S.I. No. 107 of 1999),

Wireless Telegraphy Act, 1926 (Section 3) (Mobile Telephones) Exemption Order, 1997 (S.I. No. 409)

Other Regulations:
European Communities (Electronic Communications Networks and Services)(Authorisation) Regulations 2003, SI No. 306 of 2003

Definitions from Regulation 2:
'Harmful interference' means interference which endangers the functioning of a radionavigation service or of other safety services or which otherwise seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with the applicable European Community or national regulations.

Relevant Regulations

Regulation 9 (1) of the Authorisation Regulations provides ComReg must exempt apparatus from the Wireless Telegraphy Acts where it considers that:

The risk of causing harmful interference, arising out of the use, for the provision of an electronic communications network or service of any class or description, of apparatus for wireless telegraphy is negligible; and

The effective and appropriate management of the radio spectrum would not be adversely affected thereby.

Regulation 9 (2) of the Authorisation Regulations provides that where ComReg exempts apparatus from the Wireless Telegraphy Acts, it may specify conditions for use of the apparatus.

European Communities (Electronic Communications Networks and Services)(Framework) Regulations 2003, SI No. 307 of 2003

Definitions from Regulation 2:
"electronic communications network", means transmission systems and, where applicable, switching or routing equipment and other resources which permit the conveyance of signals by wire, by radio, by optical or by other electromagnetic means, including satellite networks, fixed (circuit- and packet-switched, including Internet) and mobile terrestrial networks, electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable television networks, irrespective of the type of information conveyed

[1] "electronic communications service", means a service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks, including telecommunications services and transmission services in networks used for broadcasting, but excludes (a) a service providing, or exercising editorial control over, content transmitted using electronic communications networks and services, and (b) an information society service, as defined in Article 1 of Directive 98/34/EC, which does not consist wholly or mainly in the conveyance of signals on electronic communications networks.

Other National Texts:
Conditions of a General Authorisation,
http://www.comreg.ie/publications/conditions_of_general_authorisation.583.101047.p.html,

Guidelines relating to General Authorisations,
http://www.comreg.ie/publications/guidelines_relating_to_general_authorisations.583.101049.p.html

European Commission Mandate:
EC Mandate on Mobile Communication Services On Board Aircraft (MCA) 12/10/2006

'Eurotariff' Regulation:
Regulation (EC) No 717/2007 of the European Parliament and of the Council of 27 June 2007 on roaming on public mobile telephone networks within the Community and amending Directive 2002/21/EC.

EC Decision:

Commission Decision 2008/294/EC on harmonised conditions of spectrum use for the operation of mobile communication services (MCA services) in the European Community

EC Recommendation:

Commission Recommendation 2008/295/EC on authorisation of mobile communication services (MCA services) in the European Community

CEPT Texts:
ECC/DEC/(06)07 ECC Decision of 1 December 2006 on the harmonised use of airborne GSM systems in the frequency bands 1710-1785 and 1805-1880 MHz
ECC Report 93 'Compatibility between GSM equipment on board aircraft and terrestrial networks (incl SEAMCAT scenario files)' available at www.ero.dk