

ETSI MSG #8
Sophia Antipolis, October 28 — 29 2004

M-04-021

Title: LS on considerations to avoid interference for terrestrial networks for onboard GSM networks

Source: ETSI MSG
To: 3GPP GERAN, 3GPP RAN
Cc:

Contact Person: Stephen Dutnall (SITA. Inc.)

Tel. Number: +41 22 747 62 69

E-mail Address: stephen.dutnall@sita.aero

Attachments: RAC Doc(04)31rev2 GSM use aboard planes

1. Overall Description:

Currently there are several companies developing systems to support on board GSM access to commercial aircraft for both short haul and long haul aircraft. Service/access to GSM connectivity is currently envisaged to be during the cruise phases of flight (cruise phase currently loosely defined at anything above 10,000 feet / 3,000 metres). The concept envisages an electromagnetic screening mechanism to prevent visibility of terrestrial networks onboard the aircraft above this altitude, thus preventing the terminals from inadvertently diverting to their home network, whilst at the same time offering a GSM/GPRS access roaming service via the pico network onboard.

A legal framework (attached to this LS) is being developed within the European regulatory group CEPT ECC RA6 in order to allow the usage of spectrum for GSM access on two pre-conditions. Point d) of the legal framework states:

d) That, provided the spectrum power levels and frequency bands used are suitably controlled, it is possible to ensure that there is no harmful interference with aircraft systems or GSM systems operating outside the aircraft;

MSG understands that it is outside of the scope of both MSG and 3GPP to define the limits of harmful interference with aircraft systems.

MSG however looks to GERAN and RAN groups for their advice on what constitutes harmful interference to terrestrial GERAN and UTRAN radio networks.

2. Actions:

To 3GPP TSGs RAN and GERAN.

ACTION: MSG kindly asks RAN and GERAN to provide responses to the points raised below and report to MSG at their earliest convenience.

Action point 1) MSG asks GERAN and RAN to help in providing input to understand the aspects of harmful interference including the receive sensitivities of UEs/MSs and GERAN/UTRAN BTS/Node B equipment considering the onboard GSM service introduced above.

Action point 2) MSG asks if there are any other aspects, features or work items that should be considered in this work area.

Action point 3) MSG also asks if any simulations on the RF characteristics of terrestrial networks at altitude have been carried out and whether GERAN and/or RAN can provide the results of such simulations.

Source: SITA

Subject: GSM use aboard planes

ELECTRONIC COMMUNICATIONS COMMITTEE

DRAFT

ECC Decision

of DD MMM 2004

on the free circulation and use of Airborne GSM Base Transceiver Stations

in the frequency bands

1710 – 1785 and 1805 – 1880 MHz

(ECC/DEC/(04)**)

EXPLANATORY MEMORANDUM

1 INTRODUCTION

There is increasing demand to use mobile communications from wherever you are located, including the use of GSM mobile phones on board aircraft. However, to ensure successful operation of systems which will facilitate this there is a need to establish a basis for the free circulation of such equipment within Europe and to provide access to the required spectrum.

2 BACKGROUND

It is a general aim of the Electronic Communications Committee (ECC) to facilitate the free circulation and use of radio equipment. An objective of this Decision is to extend this general goal to include the air transportation domain.

The system under consideration in this decision, (i.e. the GSM Base Transceiver Station and its associated equipment), together with the GSM spectrum used on board an aircraft, are intended to provide an interface between the passengers' GSM handsets and the terrestrial networks providing the full range of services normally provided on a GSM network. To ensure that the mobile phones on board the aircraft do not attempt to register with terrestrial Base Transceiver Stations, the equipment installed on board will include a control unit requiring the mobile phones to register with the on board system. The link between the GSM system on board the aircraft and the terrestrial network does not form part of this Decision. The link will operate in a different frequency range using satellite links. These satellite links will be in accordance with ECC Decisions. The system will only be operated during certain phases of the flight and will not be operated while the aircraft is on the ground or during take-off and landing.

There is a need for a harmonised approach to the GSM Base Transceiver Station together with free circulation and use of the system to ensure the provision of an uninterrupted service whilst aircraft cross the borders of various countries and to reduce the regulatory requirements placed on administrations, GSM network operators and aircraft operators.

The GSM Base Transceiver Stations shall conform to the ETSI specifications detailed in EN 301 502 except where different parameters are required to meet airworthiness certification demands.

3 SPECTRUM ISSUES

It will frequently be the case that on any one flight an aircraft will travel through the airspace of more than one country with the time spent in the airspace of any individual country being of short duration. Thus a procedure is required to ensure that the spectrum of the GSM Base Transceiver Station can be used in any national airspace that the aircraft is crossing.

Having regard to: -

- (i) The provisions of Article 18 of the ITU Radio Regulations;
- (ii) The provisions of Article 30(a) of the Chicago Convention; and
- (iii) The fact that the system under consideration in this decision will be controlled so as to ensure that there is no interference with GSM systems operating outside the aircraft cabin

It is considered that the responsibility for control of the GSM spectrum utilised on board an aircraft as part of the system should be that of the country of registration of the aircraft.

4 AIRWORTHINESS CERTIFICATION

Airworthiness verification of the BTS and its associated equipment will be required and is the separate responsibility of the civil aviation authorities of the country of registration of the aircraft.

5 REQUIREMENT FOR AN ECC DECISION

There is a need for an ECC Decision to allow for the harmonised operation of GSM Base Transceiver Stations and to permit access to the GSM frequency bands.

ECC Decision
of DD MMM 2004

on the free circulation and use of Airborne GSM Base Transceiver Stations
in the frequency bands
1710 – 1785 and 1805 – 1880 MHz
(ECC/DEC/(04)**)

“ The European Conference of Postal and Telecommunications Administrations,

Considering

- a) That the bands 1710 – 1785 and 1805 – 1880 MHz are allocated to the mobile service on a co-primary basis in the ITU Radio Regulations;
- b) That within Europe the bands 1710 – 1785 and 1805 -1880 MHz have been designated for GSM usage;
- c) That it is possible by use of an airborne Base Transceiver Station (the system), to permit the use of GSM handsets on board an aircraft during flight;
- d) That, provided the spectrum power levels and frequency bands used are suitably controlled, it is possible to ensure that there is no harmful interference with aircraft systems or GSM systems operating outside the aircraft;
- e) That, as such a system will confine the effect of the relevant GSM spectrum within the aircraft, it will therefore also facilitate the sharing of spectrum resulting in more efficient use of spectrum;
- f) That the equipment will not be operated while the aircraft is on the ground. The equipment will be switched on during the ascent phase, will be operational during the cruise phase and switched off during the descent phase;

- g) That, where applicable, the technical characteristics of such a system will be in accordance with the relevant ETSI standards and specifications, subject to the control of power levels and frequency band used;
- h) That for the purposes of the Decision the aircraft cabin space is considered to be equivalent to the national territory of the country of aircraft registry and any such system will only be used within the aircraft;
- i) That accordingly responsibility for control of the GSM spectrum utilised on board an aircraft as part of such a system is that of the country of registration of the aircraft;
- j) That in accordance with Article 18 of the ITU Radio Regulations and Article 30 of the Chicago Convention the System will be authorised by one administration but will be operated within the airspace of other countries;
- k) That the System and its associated equipment will be subject to airworthiness approval by the aviation safety authorities;
- l) The system shall comply with the relevant parameters specified in EN 301 502 and EN301 511 except where the airworthiness certification specifies differently;
- m) That this Decision shall not impede EEA member countries from fulfilling their obligations according to Community laws.

DECIDES

1. That the spectrum power levels and frequency bands shall be controlled to ensure that there is no harmful interference with aircraft systems or GSM systems operating outside the aircraft;

2. That administrations shall allow free circulation and use of such systems provided that the system operator either holds the required spectrum licence or has been exempted from the need to do so, in each case by the country of registration of the aircraft;
3. That this Decision shall enter into force on [dd mmm yyyy] [or if possible a date before that];
4. That administrations shall communicate the national measures implementing this Decision to the ECC Chairman and the Office when the Decision is nationally implemented.

Note:

Please check the CEPT web site (www.cept.org) for the up to date position on the implementation of this and other ECC Decisions.