



European Radiocommunications Committee (ERC)
within the European Conference of Postal and Telecommunications Administrations (CEPT)



**COMPATIBILITY STUDY BETWEEN THE FIXED SERVICE
AND MOTION SENSORS AT 10.5 GHz**

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1 INTRODUCTION

CEPT/ERC has developed Recommendation 12-05 for the frequency range 10.0-10.68 GHz on the harmonisation of this band for the fixed service (FS) (including ENG/OB).

A new CEPT/ERC recommendation is being developed covering, *inter alia*, the operation of short range devices within this frequency range. The existing recommendation T/R 60-01 (low power radiolocation equipment for detecting movement and for alert) suggests, as a second choice band, the use of 10.5-10.6 GHz with 500 mW EIRP systems. This band is only allocated in some countries for this application, sometimes with a lower EIRP.

This report deals with compatibility issues between the Fixed Service and motion sensors / interrogation systems in the frequency band 10.5-10.6 GHz.

2 EFFECT OF SUCH SYSTEMS ON FS RECEIVERS

Consider only one low power device equipment, with an interfering power of 500 mW, at a frequency falling within a radio relay receiver bandwidth.

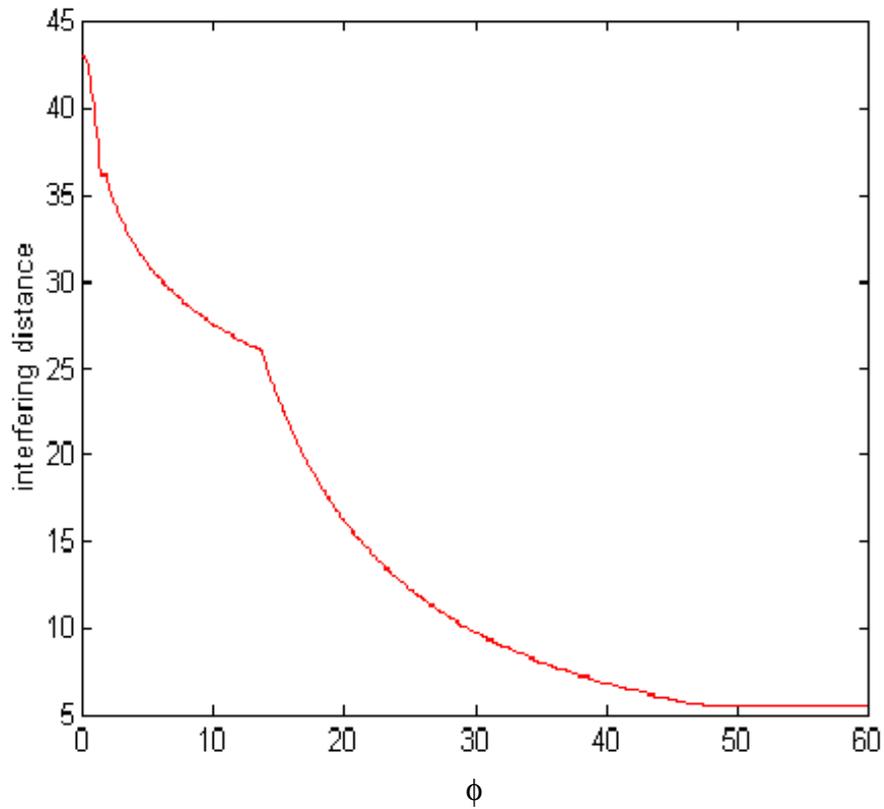
A FS system at this frequency has the following characteristics :

- Modulation : 4-PSK
- Bit rate : 34 Mbit/s
- Maximum long term admissible interference : -108 dBm
- Bandwidth : 17 MHz
- Antenna diameter : 1.6 m
- Maximum antenna gain : 43 dB
- Antenna pattern : according to ITU-R Rec.699-2

Interfering distances are derived according to the spherical earth diffraction model (ITU-R Rec.526-2). Additional obstacles and possible building attenuation are not taken into account in the calculation.

The result shows that the interfering distance ranges from 6 to 43 km, depending on the angle ϕ between the wanted transmitter pointing direction and the interfering equipment pointing direction. The interfering area is around 400 km².

The interfering area also depends on the number of installed equipments which are assumed to increase significantly because of new interrogation equipments.



3 CONCLUSION

Sharing between full power (500mW EIRP) motion sensors/interrogation equipments and the fixed service or ENG/OB is not practicable. Note that CEPT/ERC Working Group Frequency Management defined the band 10-10.68 GHz as a harmonised frequency tuning range¹ for ENG/OB systems.

¹ 'Tuning range' is the frequency range within which the equipment is capable of being tuned to any one in a range of specified frequencies whilst maintaining the required technical and operational characteristics.