

Q **Response to Ofcom Notice on Automotive Short Range Radar at 79GHz**

Introduction

QinetiQ (www.QinetiQ.com) was formed in 2001 from the UK Defence Evaluation and Research Agency (DERA) and is one of Europe's largest science and research organisations employing some 9000 staff. QinetiQ is developing surveillance and security products and believes that radars operating in the 77GHz band will have great utility for airport safety including Ground Movement Control (GMC), foreign object detection, perimeter security and counter terrorism.

Thus we make the following request that the exemption contained within Ofcom's proposed regulations (reference [1]) is broadened to include the use of this frequency in airports and for asset protection. Specific comments are given below and further technical justification can be found in Annex A and B.

Comments

- a) Please accept our apologies for the late submission of our comments and we hope they can still be included in the consultation.
- b) The Ofcom proposal document currently refers to the application of automotive short-range radar equipment to improve road safety. We would like the scope of the exemption to be liberalised to cover airport safety and asset protection.
- c) The benefit to operating at a frequency of 77GHz is that a very low-powered, lightweight and compact sensor can be utilised. Therefore, the ease of deployment and high resolution of this technology lends itself to the complete surveillance of an airport including GMC, surveillance of the airport perimeter fence and critical areas in a perimeter security/asset protection role, and the detection of foreign objects (FOD) on the surface of the runway. Taken together, these applications of 77GHz technology would provide a substantial improvement to airport safety.
- d) Please note that we do not wish to broaden the technical specification of the requirements specified in reference [1] and therefore do not anticipate any increase in the hazards associated with mutual interference between other MMW sensors due to our proposed extended scope.
- e) The relatively low-cost and availability of automotive RF components at this frequency will enable radar developers to produce very cost-effective systems that can be tailored to provide enhanced safety to all categories of airports – both large and small.
- f) The compact nature of sensors at this frequency also provides utility for short-range perimeter security and asset protection which is becoming increasingly widespread in support of counter terrorism.

- g) We have successfully applied for a non-operational development licence to perform tests of a 77GHz radar at Nottingham East Midlands Airport (NEMA), and an application for an operational licence has been received by the National Frequency Assignment Panel (NFAP) and is currently being processed.

Annex A

Ground Movement Control/Surface Movement Radar System

Conventional surface movement radar systems use large single antennas – up to 7.5 metres – on their own towers or on control tower buildings. These are generally single high-power sensors that often have problems with coverage blind spots. The use of 77GHz compact radars enables a new approach comprising a network of compact, high-resolution radars that are distributed appropriately around an airfield to provide optimal overlapping coverage of the runway and taxiways/aprons. The radar in the experimental system at NEMA is built around an automotive FMCW RF-source which transmits at a frequency of 76.2GHz and provides a range resolution of 250mm.

Each radar head detects the movement of aircraft and vehicles in the vicinity of the airfield and produces foreground video (targets), background video (clutter) and plot extracted target reports labelled with a unique target number. This enables Air Traffic Control (ATC) to maintain a picture of aircraft/vehicle movements on the airfield in severe weather conditions, e.g. fog, rain, etc. Automated detecting provides warning of dangerous situations developing on the airfield.

Annex B

Perimeter Security

There are significant advantages to operating an asset protection system at a frequency of 77GHz. The philosophy behind the sensor is the use of MMW automotive RF technology for the radar front-end to provide a major benefit in counter terrorism applications.

The benefits for using this frequency are:

- It is possible to produce light weight compact sensors which are easy to transport and deploy
- Easy/rapid installation
- High spatial resolution from a compact sensor
- Rapid, wide-area search compared against other non-RF sensors
- 360° coverage in day/night and poor weather conditions
- Cost-effective hardware benefits the use of multiple sensors to obviate the effects due to shadowing from terrain/culture

References

- [1] “Notice of Ofcom’s proposal to exempt automotive short range radar users at 79GHz from wireless telegraphy licensing”, Ofcom, 9th December 2004