



Proven Multilateration and ADS-B Surveillance Solutions
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ET 09-55

Received & Inspected
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FCC Mail Room

6 February 2009
Mr. Julius Knapp
Chief, Office of Engineering and Technology
Federal Communications Commission
445 12th Street, SW
Washington DC 20554

WAIVER--EXPEDITED ACTION REQUESTED

Dear Mr. Knapp:

Pursuant to §1.925 of the Commission's rules, Era Systems Corporation ("Era"), hereby requests a waiver of §2.803, §15.201, and §15.253 and to permit the installation of no more than 10 76-77 GHz radars on ground structures at Hartsfield-Jackson Atlanta International Airport. In the near future we intend to submit a petition for rulemaking to ask for a permanent change of this rule. We had considered the simpler procedure of requesting an experimental license pursuant to Part 5 of the Commission's Rules, but in view of the safety nature of the proposed system in tracking vehicles and aircraft close to the terminal building, the limitations and uncertainties of Part 5 were unacceptable to the airport operator.

Details of Waiver Requested

When §15.253 was adopted in 1995 there was no operational experience with automotive radars and there was uncertainty about how well they could share spectrum with other possible users of the same band. In the NPRM that proposed these rules initially, the Commission stated,

In view of the promise and importance of this technology, and its intended use for public safety purposes, we believe it merits special consideration. We tentatively conclude that it is appropriate to take steps to minimize the likelihood of interference to such systems, notwithstanding the assertions of the automobile manufacturers that this technology would have a low susceptibility to receiving interference. Accordingly, we are proposing to designate three of the twelve millimeter wave bands, as well as part of a fourth band, for use by vehicular radar systems and we are not proposing any other new uses for them at this time.¹

Thus the Commission chose to err on the side of caution with respect to sharing the 76-77 GHz band between vehicle radars and other systems while recognizing that such sharing was possible. This was reaffirmed when the rules were adopted,

Because of safety considerations, we agree with commenters that unlicensed use of the 76-77 GHz band should be limited for the time being to vehicle radar systems. In addition, as discussed below in the Second Notice of Proposed Rule Making, we also propose to temporarily restrict amateur use of the band until sharing criteria can be developed. We anticipate that vehicle radar systems may eventually be used for vehicle control, and this heightens our safety concerns regarding possible interference to these systems. Because the development of vehicle radar systems is still ongoing, it is difficult at this time to develop appropriate sharing criteria. While we are concerned about safety considerations, unlicensed bands are generally allocated to uses which can co-exist without causing detrimental interference. In the future, we expect that there will be non-vehicle radar systems which can successfully operate in these bands without causing interference. However, we wish to ensure that vehicle radar systems will have sufficient spectrum and design flexibility to develop their systems successfully, so that at this time we are restricting use of the band to vehicle radar systems.² (Emphasis added)

¹ Notice of Proposed Rulemaking, Docket 94-124 (November 8, 1994) 9 FCC Rcd 7078 at para. 29

² First Report and Order and Second Notice of Proposed Rule Making, Docket 94-124 (December 15, 1995) 11 FCC Rcd 4481 at para. 20

There was also concern that radar equipped automobiles might be stationary, *e.g.* at a traffic light, and that pedestrians might be very close to the transmitter antenna for several minutes resulting in a high RF exposure due to the short distance. As a result of these concerns, §15.253 included provisions that restricted use to “vehicle-mounted field disturbance sensors used as vehicle radar systems” (§15.253(a)) and had special restrictions decreasing permitted power “(i)f the vehicle is not in motion” (§15.253(b)(1)). These conditions are the root cause of this waiver request. Since noncompliant equipment can not be approved or sold under the present rule, we are also requesting waiver of the marketing provisions of §2.803 and the requirement for equipment authorization in §15.201.

We asked that the waiver be limited at this time to the installation and use of no more than 10 76-77 GHz radars on ground structures at Hartsfield-Jackson Atlanta International Airport. We proposed that the waiver be limited to installations where there is no illumination of roads that are accessible by the general public. (We can achieve this by careful siting of the radars and by blanking the rotation in directions where there are roads within the fields of view.) Finally we propose that the waiver be limited to units that comply with ETSI 301091 for reasons described below.

Proposed Use

This waiver request is for a system of approximately 8 76-77 GHz radars that will be attached to ground structures at Hartsfield-Jackson Atlanta International Airport. The radar units will be sited on the roof of the terminal buildings at Atlanta Airport to provide aircraft tracking coverage of aircraft and vehicles in the difficult ramp and gate area where cooperative surveillance may not be feasible. The radar’s range has been estimated at 400M in clear weather and the units are sited such that their coverage is limited to the ramp and gate areas. The radar provides updated position information once per second. Data from these units is fused with other flight track data sources to provide complete and persistent aircraft and vehicle tracking for airport management purposes.

The Commission’s Rules restrict 76-77 GHz to “vehicle-mounted” radars and the initial European regulations did the same. However, the Commission’s European counterparts have now taken a different approach for the band. In 2001 ETSI modified its standards to allow use of radars in this band to be used for fixed “infrastructure”, including fixed radars that monitor road traffic. ETSI required that regulatory documents change “the comments relative to the 76 – 77 GHz band from ‘vehicular systems’ or ‘vehicle radar systems’ to ‘vehicle or road to vehicles systems’ or any equivalent sentence”³. At the CEPT level, the European Communications Committee adopted this change and decided that “that the band 76-77 GHz shall be used for vehicular or infrastructure radar systems”⁴.

The FCC’s UK counterpart, Ofcom has also implemented this change. Ofcom now states that “(t)he 76 to 77 GHz band is for onboard vehicle and infrastructure radar systems.”⁵ Ofcom has adopted a 55 dBm peak power limit for both vehicle radars and “infrastructure radar”⁶. We note that the Danish regulator, National IT and

³ ETSI TR 101 983 V1.1.1 (2001-07), “Electromagnetic compatibility and Radio spectrum Matters (ERM); Radio equipment to be used in the 76 GHz to 77 GHz band; System Reference Document for Short-Range Radar to be fitted on road infrastructure”

⁴ ECC/DEC/(02)01 “ECC Decision of 15 March 2002 on the frequency bands to be designated for the coordinated introduction of Road Transport and Traffic Telematic Systems”

⁵ <http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/rfms/short/> See Section 7k

⁶ Ofcom, “UK Interface Requirement 2030 - Licence Exempt Short Range Devices November 2006, Table 3.11 (http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/archived/uk2030.pdf?page=22)

Telecom Agency, has adopted the same basic regulation.⁷ These changes were enabled by the development and adoption of a technical standard for this band: ETSI EN 301 091.⁸

Thus while there is not a general standard for band sharing compatibility between automotive radars and fixed radars, standards in Europe have been developed that allow sharing between present automotive radars and fixed units using the ETSI EN 301 091 technology. This waiver asked for only the use of radars that comply with this ETSI standard. We plan to request the Commission in the near future to institute rulemaking to make a more general provision in §15.253 for fixed radars in 76-77 GHz but that will probably be a time consuming deliberation since the Commission has not, to date, regulated the details of the emissions of automotive radars in this band beyond power and frequency limits. This waiver will allow immediate use of this technology in Atlanta for a safety-related use and will result in experience that will be useful in the more general rulemaking.

We have informally coordinated this request with SARA, Strategic Automotive Radar Frequency Allocation group, comprised of automotive manufacturers and component suppliers, which is the major trade group in this automotive radar area. Dr. Gerhard Rollmann, Chairman SARA has indicated, “The devices shall fulfill the requirements of EN 301091. In this case we expect no special concerns from the automotive side for the experimental use in Atlanta at least.”⁹ We are continuing a dialog with SARA in the hope of eliminating any possible controversy with respect to this waiver request.

Specifics of Atlanta Installation

The radar to be used if this waiver is granted is a Navtech I800-E unit that is used for similar applications in Europe. Its basic parameters are given in Table I.

Table I: Radar Parameters

This unit complies with ETSI EN 301 091-1.

Navtech I800-E Radar	
Radar Frequency	76 – 77 Ghz
Range	400 metres
Range (ICAO 16mm Rain P/hour)	370 metres (Approximately)
Transmit Power	55dBm (peak) 23.5 dBm (mean)
Input Power	24V DC (22 Watts)
Data Interface	100 Mbps Ethernet
Range Resolution	0.25m

⁷ National IT and Telecom Agency, Danish radio interface 00 030, Radio equipment for Road Transport and Traffic Telematics (RTTT), August 2002 (<http://en.itst.dk/r-tte-equipment/filarkiv/radio-interface-regulations/030%20INTERFACE-RTTT-ENG.pdf?page=2>)

⁸ ETSI EN 301 091-1 V1.2.1 (2004-11), *European Standard (Telecommunications series, Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Radar equipment operating in the 76 GHz to 77 GHz range;*

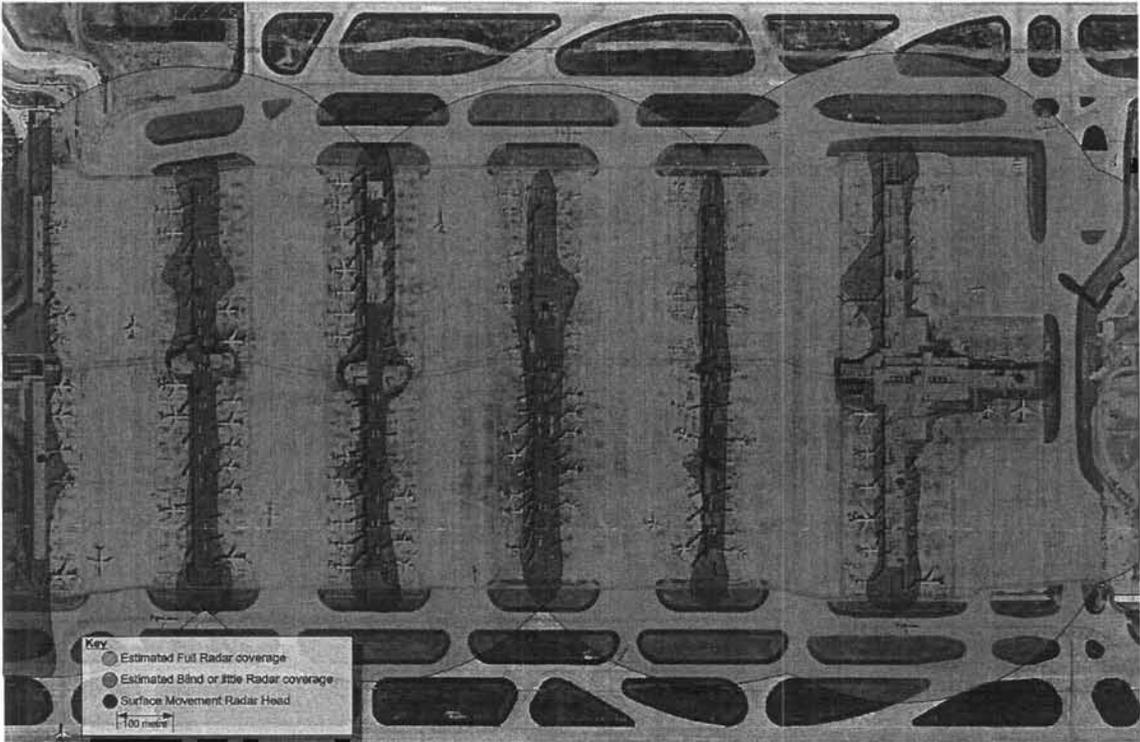
⁹ E-mail from Dr. Rollmann to Michael Marcus, Consultant to Era, January 20, 2009

Measurement Rate	850 per second
Target false alarm rate	1 per 24 hour period
Scanner field of view	360°
Scan speed	1.0 Hz
Environmental	IP67, NEMA-4X
Temperature	-20° to 60° Centigrade

Figure 1, below shows the currently planned locations for the radars. At present 8 units are planned, but 10 units are requested in this waiver to allow for possible changes. There is a low speed public road leading to the terminal at the left side of the photograph, none of which will be illuminated by these radars. All the units will have a downtilted beam to maximize ground illumination and will be blanked in the azimuths in which there is no ramp and gate area to be monitored. Thus we expect negligible illumination of the public roads.

Figure 1: Terminal area showing expected location of radars and their coverage

Concourse Area – 400m SMR Heads – assumed mounted a height of no more than 15m above ground



However, we note that all the car radars marketed in the US presently are ETSI EN 301 091 compliant as is the radar in this application. Thus overlapping illumination should not be a problem in the unlikely event it occurs. We have commenced a dialog with SARA: Strategic Automotive Radar Frequency Allocation Group which represents the vehicle radar industry to coordinate the technical details of this experiment and discuss the parallel petition for rulemaking.

Legal Issues

§1.925(b)(3) provides

The Commission may grant a request for waiver if it is shown that:

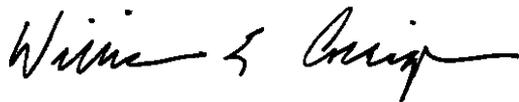
- (i) The underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest; or
- (ii) In view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.

In this case, both circumstances apply to this request. For the case of §1.925(b)(3)(i) we have shown that the underlying purpose of §15.253 was to protect the safety-related operations of automotive radars in this band *on an interim basis* pending development of sharing conditions. The development of the ETSI EN 301 091 standard and its regulatory implementation by the Commission's European counterparts shows that this particular standard when used in fixed installations is compatible with automotive radars. But erring on the side of caution, this waiver requests carries the additional provision that roads accessible by the public will not be illuminated. Thus there is double protection of the Commission's original intent.

With respect to the requirements of §1.925(b)(3)(ii), the circumstances of the proposed use with a waveform compatible with automotive radars and no illumination of roads, the application of the rules would be contrary to the public interest and would impose a significantly higher costs on the airport operator to improve safety in ramp areas adjacent to the terminal buildings. There is no other commercially available non-cooperative surveillance technology which satisfies the needs of US airports, while being compatible with European and other countries, that also meets the Commission's present rules.

For the above reasons we respectfully request a waiver of the rules described above. We asked that the waiver be expedited in view of the safety nature of this proposed use. Please refer technical questions to Dr. Michael Marcus, consultant to Era, 301-229-7714, marcus@marcus-spectrum.com. Please refer other questions to the undersigned at 703-637-7250, or bcolligan@erabeyondradar.com.

Sincerely,



William E. Colligan
V.P. & General Management, Airport Operations Solutions
Era Systems Corporation