

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

<b>In the Matter of</b>	)	
<b>Amendment of Parts 1, 2, 15, 90 and 95 of the Commission’s Rules to Permit Radar Services In the 76-81 GHz Band</b>	)	<b>ET Docket No. 15-26</b>
	)	
<b>Amendment of Part 15 of the Commission’s Rules To Permit the Operation of Vehicular Radar Services in the 77-78 GHz Band</b>	)	<b>RM-11666</b>
	)	
<b>Amendment of Sections 15.35 and 15.253 of the Commission’s Rules Regarding Operation of Radar Systems in the 76-77 GHz Band</b>	)	<b>ET Docket No. 11-90 RM-11555</b>
	)	
<b>Amendment of Section 15.253 of the Commission’s Rules to Permit Fixed Use of Radar In the 76-77 GHz Band</b>	)	<b>ET Docket No. 10-28</b>
	)	
<b>Amendment of the Commission’s Rules to Permit Radiolocation Operations in the 78-81 GHz Band</b>	)	<b>WT Docket No. 11-202</b>

**REPLY COMMENTS OF MANTISSA LTD.**

Mantissa Ltd. (“Mantissa”) is gratified by the many comments recently filed in ET Docket No. 15-26 demonstrating that enabling use of spectrum in the 76.0-81.0 GHz band for a wider variety of radar applications will be extremely beneficial to the public, while posing only a minimal, and eminently manageable, risk of interference with existing uses of the spectrum.

Mantissa files these Reply Comments to address the unsupported contention of certain commenters, representing interests invested in vehicular radar, that further study of interference risks should be undertaken before other beneficial uses of the spectrum are enabled. In fact, the interference risks are well known, readily described, and easily mitigated. Moreover, while the benefits of vehicular radar are undisputed, the significant benefits of fixed perimeter security radar, wingtip radar, heliborne radar, radar for industrial applications, and other applications still

to emerge must not be disregarded. Responsible, shared use of the 76.0-81.0 GHz spectrum band will afford the public crucial safety and security improvements. These important benefits should not be foreclosed or needlessly delayed based solely on the vague objections of current spectrum users.

**Radar Interference Risks Are Well Understood, And Easily Mitigated**

Bosch, and (less vociferously) other commenters with an interest in vehicular radar, argue that the spectrum in question should not be made available for fixed radar and other beneficial uses, unless and until additional studies are conducted to confirm or disprove the compatibility of such uses. With regard to fixed radar, at least, this argument has no merit. Several authoritative studies addressing interference among and with vehicular radar have been conducted,<sup>1</sup> and all have reached the predictable conclusion that the potential interference from fixed radar devices such as Mantissa's is the same, and is susceptible to the same mitigation, as interference among vehicular radar devices.

The MOASRIM study, underwritten by vehicular radar interests, teaches us that although a certain level of interference indeed exists between radar devices of the same type (automotive and nonautomotive), there is also an excellent functional coexistence among these radars, even in relatively close proximity from each other. This conclusion has been demonstrated

---

<sup>1</sup> See, e.g.:

i) European Conference of Postal and Telecommunications Administrations, Electronic Communications Committee, Report 222, "*The impact of Surveillance Radar equipment operating in the 76 to 79 GHz range for helicopter application on radio systems*," approved September 2014: <http://www.erodocdb.dk/doks/relation.aspx?docid=2530>

ii) ETSI Technical Report, "*Electromagnetic compatibility and Radio spectrum Matters (ERM); System Reference document (SRdoc); Technical characteristics of Radio equipment to be used in the 76 GHz to 77 GHz band; Short-Range Radar to be fitted on fixed transport infrastructure*," ETSI TR 103 148 (June, 2006):

[http://www.etsi.org/deliver/etsi\\_tr/103100\\_103199/103148/01.01.01\\_60/tr\\_103148v010101p.pdf](http://www.etsi.org/deliver/etsi_tr/103100_103199/103148/01.01.01_60/tr_103148v010101p.pdf)

Last accessed April 15, 2015.

iii) *MOSARIM Project Final Report*, dated December 21, 2012 (MOSARIM Final Report): <http://cordis.europa.eu/docs/projects/cnect/1/248231/080/deliverables/001-D611finalreportfinal.pdf> Last accessed April 2, 2015.

theoretically,<sup>2</sup> experimentally,<sup>3</sup> and empirically.<sup>4</sup> With regard to the empirical evidence, as other commenters have noted, automobiles equipped with radar have been on the road for some 15 years now, without reported interference. Mantissa believes that this harmonious coexistence among vehicular radars can equally be achieved for mobile and fixed radars, assuming that all types of commercial radars operating in the same spectrum band comply with the performance envelope currently directed by the rules (*i.e.*, 55 dBm peak EIRP and 50 dBm average EIRP).

Of course, all of the above considerations relate to the potential for interference among fixed and vehicular radars in close geographical proximity (for example, on roadsides or where fixed radar directly illuminates a road). In most instances, however, fixed radar will be mounted at a distance from traveled roads, substantially mitigating the risk of interference. As to the impact of more distant, off-road fixed radars, even Bosch concedes there should not be any interference: “Interaction between those automotive radars and active or passive services that are spectrum-sharing partners, *other* than those in immediate geographic proximity to the automobiles (such as fixed roadside radars or fixed radars that might illuminate a public roadway) is therefore highly unlikely.”<sup>5</sup>

**There Is An Immediate, Unmet, And Critical Need For Perimeter Security Devices  
Such As Mantissa’s Miniature Radar**

Reports illustrating the urgent need for improved, cost-efficient perimeter security technology are appearing with increasing frequency. An Associated Press investigation, the results of which were published April 9, 2015, revealed at least “268 perimeter breaches since

---

<sup>2</sup> See, "Automotive radar – investigation of mutual interference mechanisms", Goppelt, M.; Blocher, H.-L.; Menzel, W. at <http://www.adv-radio-sci.net/8/55/2010/ars-8-55-2010.pdf> Last accessed April 14, 2015. See also, <http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=5760761&isnumber=5760651>

<sup>3</sup> See, MOSARIM Final Report and related Deliverables.

<sup>4</sup> See, Comments of Robert Bosch LLC, filed in ET Docket No. 15-26, April 6, 2015, at page 6, footnote 9.

<sup>5</sup> *Id.*

2004 at airports that together handle three-quarters of U.S. commercial passenger traffic.”<sup>6</sup> The need for improved security is well recognized.<sup>7</sup> Currently available solutions, however, have technological limitations, and can be cost-prohibitive.<sup>8</sup> Enabling the commercial availability of miniature radar sensors operating in the 76.0-81.0 GHz band will immediately provide a lower cost, technologically superior solution for a host of important homeland and commercial security applications that currently are underserved.

### Conclusion

Mantissa urges the Federal Communications Commission (the “Commission”) to act promptly on the pending Notice of Proposed Rulemaking in the above-referenced docket, and to approve expanded use of the 76.0-81.0 GHz spectrum for fixed radar. Mantissa thanks the

---

<sup>6</sup> *AP investigation details perimeter breaches at US airports*, by Mendoza and Pritchard, Associated Press, April 9, 2015:

[http://hosted.ap.org/dynamic/stories/U/US\\_AIRPORT\\_INTRUDERS\\_ABRIDGED?SITE=AP&SECTION=HOME&TEMPLATE=DEFAULT](http://hosted.ap.org/dynamic/stories/U/US_AIRPORT_INTRUDERS_ABRIDGED?SITE=AP&SECTION=HOME&TEMPLATE=DEFAULT) “U.S. Sen. Barbara Boxer, D-Calif., said she's been asking the TSA and airport officials since the San Jose case to ‘work together and resolve this alarming situation’ and added: ‘Enough is enough, let's get it done.’”

<sup>7</sup> “Congressman Eric Swalwell, D-Calif., said the number of airport breaches over the past decade is cause for action and that new technologies should be installed on perimeters. ‘Bringing down an airliner and killing innocent Americans remains our enemies' highest-value target. Porous airport perimeters are major vulnerabilities that terrorists could exploit,’ he said. ‘I'm continuing to call for airports to use technologies that would alert officials the moment a perimeter is breached.’”

*Firms push high-tech solutions to fortify airport perimeters*, by Mendoza and Pritchard, Associated Press, April 10, 2015:

[http://hosted.ap.org/dynamic/stories/U/US\\_AIRPORT\\_INTRUDERS\\_TECHNOLOGY?SITE=AP&SECTION=HOME&TEMPLATE=DEFAULT&CTIME=2015-04-10-18-09-35](http://hosted.ap.org/dynamic/stories/U/US_AIRPORT_INTRUDERS_TECHNOLOGY?SITE=AP&SECTION=HOME&TEMPLATE=DEFAULT&CTIME=2015-04-10-18-09-35)

<sup>8</sup> *See id.* “There's a lot of things that can be done,” said John Pistole, retired director of the Transportation Security Administration.... “The question is whether there's an appetite for paying for it.”

Commission and the Office of Engineering and Technology for their attention to these vitally important spectrum uses.

Respectfully submitted,

*s/ L. Elise Dieterich*

L. Elise Dieterich  
*Counsel to Mantissa Ltd.*

April 20, 2015