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

In the Matter of	)	
	)	
Amendment of Sections 15.35 and 15.253 of the Commission's Rules Regarding Operation of Radar Systems in the 76-77 GHz Band.	)	ET Docket No. 11-90 RM-11555
	)	
Amendment of Section 15.253 of the Commission's Rules to Permit Fixed Use of Radar in the 76-77 GHz Band.	)	ET Docket No. 10-28
	)	

NOTICE OF PROPOSED RULE MAKING

Adopted: May 24, 2011 **Released: May 25, 2011**

Comment date: [30 days after date of publication in the Federal Register]
Reply comment date: [45 days after date of publication in the Federal Register]

By the Commission:

I. INTRODUCTION

1. In this Notice of Proposed Rulemaking (Notice), we propose to modify Sections 15.35 and 15.253 of the rules to enable enhanced vehicular radar technologies in the 76-77 GHz band to improve collision avoidance and driver safety. Vehicular radars can determine the exact distance and relative speed of objects in front of, beside, or behind a car to improve the driver's ability to perceive objects under bad visibility conditions or objects that are in blind spots. Some examples of vehicular radar systems include collision warning and mitigation systems, blind spot detection systems, lane change assist and parking aid systems. We propose to eliminate the existing requirement that vehicular radars decrease power when the vehicle on which the radar is mounted is stopped, or not in motion, and to expand the authorization for unlicensed 76-77 GHz band radars to allow their use in fixed infrastructure systems. These modifications to the rules will provide more efficient use of spectrum, and enable the automotive and fixed radar application industries to develop enhanced safety measures for drivers and the general public. We take this action in response to petitions for rulemaking filed by Toyota Motor Corporation ("TMC") and Era Systems Corporation ("Era").[1]

[1] *See* Petition for Rulemaking of the Toyota Motor Corporation, RM-11555 (filed July 21, 2009) (Toyota Petition). Era filed comments in a proceeding in which the Commission sought comments on possible revision or elimination of rules, as part of its ten year review of its rules required under Section 610 of the Regulatory Flexibility Act (RFA). *See* "*FCC Seeks Comment Regarding Possible Revision or Elimination of Rules Under The Regulatory Flexibility Act, 5 U.S.C. 610*", *Public Notice*, CB Docket No. 09-102, DA 09-1307, released June 24, 2009. In January 2010, the Office of Engineering and Technology (OET) decided to treat ERA's comments in the Commission's ten-year review as a Petition for Rulemaking, and invited comment on starting a rulemaking proceeding to consider ERA's proposals. *Office of Engineering and Technology Seeks Comment on Era Systems Corporation's Proposal to Permit Fixed Ground-Traffic Radar at Airports in 76-77 GHz Band," Public Notice,* ET Docket No. 10-28, DA 10-127 (released January 26, 2010). On the basis of the record developed in response to that Public Notice, we invited comment on ERA's proposals in this proceeding below. We refer to ERA's comments in this proceeding as the "Era Petition for Rulemaking."

II. BACKGROUND

2. The 76-77 GHz band is in the region of the radiofrequency spectrum known as "millimeter wave" spectrum. The term "millimeter wave" derives from the wavelength of radio signals at frequencies between 30 GHz and 300 GHz, which range between 1 millimeter at 300 GHz and 10 millimeters at 30 GHz. The propagation of millimeter wave radio signals is more limited than that of radio signals at lower frequencies. Signals in the millimeter wave bands are affected by the presence of oxygen and water vapor within the atmosphere. Absorption and scattering caused by oxygen and water vapor limit the range of millimeter wave transmissions to a relatively short distance.[2] While the limited range of such transmissions might appear to be a major disadvantage, this limited range allows the reuse of frequencies within very short distances and enables a higher concentration of transmitters to be located in a geographical area than is possible with lower-frequency transmitters.[3] The 76-77 GHz band is allocated to the Radio Astronomy (RAS) and Radiolocation Services on a primary basis.[4] The band is also allocated to the Amateur and Space research (space-to-Earth) services on a secondary basis, however, amateur operations in this band are currently suspended.[5]

3. The propagation characteristics of millimeter wave frequencies, along with the relatively wide bandwidth available in the 76-77 GHz band, are desirable to the proponents of vehicular radar technology. Therefore, in 1995, the Commission adopted rules to allow the use of the 76-77 GHz band by vehicular radars on an unlicensed basis.[6] Section 15.253 of the Commission's rules specifies the technical requirements for operation of unlicensed vehicle-mounted radar systems within the bands 46.7-46.9 GHz and 76-77 GHz.[7] Vehicle-mounted radar systems are the only type of operation permitted under this section; fixed applications are not permitted. The current rules specify three sets of average power density limits for vehicle-mounted radars, all measured at 3 meters from the exterior surface of the radiating structure: 1) 0.2 μW/cm² in any direction when the vehicle is not in motion; 2) 60 μW/cm² for forward looking radars when the vehicle is in motion; and 3) 30 μW/cm² for side looking and rear-looking radars when the vehicle is in motion. The in-motion limits were based on conservative estimates of the minimum power necessary to provide the range required for the radars to operate effectively.[8] The more restrictive not-in-motion limit was adopted to ensure that human exposure to radiofrequency (RF) radiation would be reduced as much as possible to protect pedestrians crossing in front of stopped

[2] *See* Federal Communications Commission, Office of Engineering and Technology Bulletin Number 70, (July, 1997) "Millimeter Wave Propagation: Spectrum Management Implications."

[3] *Id*. *See also* "The use of the Radio Frequency Spectrum Above 30 GHz: A Consulative Document, Department of Trade and Industry, Radiocommunications Division, London, September 1988." This document quantifies the relationship of frequency reuse to useful communications working range for various frequencies. *See also* Amendment of Parts 2 and 15 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications *Notice of Proposed Rulemaking*, ET Docket No. 94-124 at para. 8, 9 FCC Rcd 7078 (1994).

[4] International footnote 5.149 of Section 2.106 of the FCC's rules applies to the 76-86 GHz frequency range. This footnote urges Administrations "to take all practical steps to protect the radio astronomy service from harmful interference." *See* 47 C.F.R. § 2.106.

[5] *See* 47 C.F.R § 97.303(s).

[6] *See* Amendment of Parts 2, 15, and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications *First Report and Order and Second Notice of Proposed Rule Making*, in ET Docket No. 94-124, 11 FCC Rcd 4481 (1996).

[7] *See* 47 C.F.R. § 15.253. This Notice is not proposing any changes to the rules for 47.6-47.9 GHz band.

[8] *See* Amendment of Parts 2, 15, and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications, *First Report and Order and Second Notice of Proposed Rule Making*, ET Docket No. 94-124 at paras. 21-27, 11 FCC Rcd 4481 (1996).

vehicles.[9] At the time these rules were adopted, Maximum Permissible Exposure (MPE) limits for RF electromagnetic fields had not yet been established and the Commission therefore chose very conservative limits for vehicle radars. Subsequent to the adoption of the Section 15.253 rules for vehicular radars in the 76-77 GHz band, the Commission adopted RF human exposure limits for this band which are far less restrictive than the level presumed appropriate at the time for not-in-motion vehicular radars.[10]

4. On July 21, 2009, the Toyota Motor Corporation (TMC) filed a petition for rulemaking requesting that the emission limits be modified for vehicular radar systems operating within the 76-77 GHz band.[11] Specifically, TMC requested that the Commission eliminate the "in-motion" and "not-in-motion" distinctions in the emission limits for vehicular radar systems and establish a single emission limit that applies in all directions from a vehicle. In response, the Commission issued a public notice requesting comments on TMC's petition.[12] Comments in favor of TMC's petition were filed by Denso Corporation (Denso); Strategic Automotive Radar Frequency Allocation (SARA); Fujitso Ten Technical Center, USA, Inc. (Fujitsu Ten); Mercedes-Benz USA, LLC (MBUSA); Denso International America, Inc. and Association of International Automobile Manufacturers, Inc. (AIAM). Comments opposing TMC's petition were filed by the National Radio Astronomy Observatory Association (NRAO). Reply comments addressing NRAO's concerns were filed by TMC, MBUSA, and the Intelligent Transportation Society of America.

5. On September 8, 2009, Era filed comments in CB Docket N0. 09-102 requesting that the Commission amend Section 15.253 of the rules to permit fixed use of 76-77 GHz radars at airports for monitoring terrestrial vehicle movement.[13] Specifically, it requested that Section 15.253 be amended to permit the unlicensed use of fixed radars at airports under the following conditions: 1) the maximum power complies with the present limits for vehicles in motion, 2) radars must be professionally installed and may not exceed the Maximum Permissible Exposure limits in Section 1.1310 of the rules,[14] 3) radars may only be used at airports recognized by FAA and must be owned and operated by either the airport operator or an air carrier licensed by FAA, or operated on their behalf, 4) radars must be installed so as to limit the power flux density reaching roads used by the general public to -57 dBW/m^2 (peak), and 5) the installer must make measurements to verify the power flux density on public roads at time of installation. The Commission found that Era's comments provided sufficient basis to be treated as a petition for rulemaking under Section 1.401 of its rules and issued a public notice seeking comments regarding Era's request.[15] Only Era filed comments in response to this public notice.

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[9] *Id.*

[10] *See* Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation, *Report and Order*, in ET Docket No. 93-62, 11 FCC Rcd 15122 (1996).

[11] *See* Petition for Rulemaking of the Toyota Motor Corporation (filed July 21, 2009).

[12] *See* Public Notice released August 26, 2009, RM-11555, Report No. 2896.

[13] *See* Era comments filed in response to "FCC Seeks Comment Regarding Possible Revision or Elimination of Rules Under The Regulatory Flexibility Act, 5 U.S.C. 610", DA 09-1307, CB Docket No. 09-102, released June 24, 2009.

[14] Era anticipates that these radars would be located in high locations such as lamp posts and roofs of terminal buildings. Thus, the MPE limits will be met because of distance separation of any humans from the main beam of the radars.

[15] *See Office of Engineering and Technology Seeks Comment on Era Systems Corporation's Proposal to Permit Fixed Ground-Traffic Radar at Airports in 76-77 GHz band*, ET-Docket No. 10-28, released January 26, 2010, 25 FCC 896 (2010). On September 30, 2009, the Commission granted Era a waiver of the rules to permit the installation of no more than 10 76-77 GHz radars at Hartsfield-Jackson Atlanta International Airport. Specifically, the Commission waived Section 15.253(a) of the rules which restricts operation in the 76-77 GHz band to vehicular (continued....)

III. DISCUSSION

6. The 76-77 GHz band offers advantages for vehicular and fixed radar systems, such as precise real-time monitoring of the position and speed of vehicles. Our proposals described below are intended to foster the development of improved radar systems that offer significant safety benefits to the general public. We also foresee economic benefits such as economies of scale and broader marketplace demand that may be attained if both the U.S. and other markets use the 76-77 GHz band for fixed and vehicular radar systems. Furthermore, we believe that the changes in power levels and use suggested by TMC and Era will not result in any increased potential of interference to licensed services.

7. TMC Petition for Rulemaking. In its petition, TMC states that when the Commission adopted the rules and emission limits for vehicular radar systems in 1995, technologies for vehicle safety support systems were still in the early stages of development. It submits that since then there has been significant growth in the use of automobile radar systems, and it is anticipated that these systems will become relatively commonplace within a few years as a result of consumer demand and the desire to increase vehicular comfort and safety.[16] TMC seeks to introduce into the United States "omni-directional" vehicular monitoring systems that operate in the 76-77 GHz band. It argues that the emission limits should be based on electromagnetic interference considerations independent of whether a vehicle is in motion or not, and requests that the Commission harmonize its technical rules for these systems with the European Telecommunications Standards Institute (ETSI) limits that are used in other parts of the world.[17] TMC believes that the current limit for not-in-motion operation, which is based on concerns regarding human exposure to radiofrequency (RF) energy, is unnecessarily conservative. TMC asks that the three limits for not-in-motion, rear-looking, and side-looking vehicular radar operation be replaced by a single peak emission limit of 55 dBm, which is equivalent to a peak power density limit of approximately 279 $\mu W/cm^2$ at a distance of 3 meters from the radiating structure. TMC also urges the Commission to specify its limits in Section 15.253 in terms of maximum peak power in a manner similar to other international standards. TMC states that specifying the emission limit in terms of maximum peak power, instead of power density, will obviate the need to specify emission limits based on beam direction (*e.g.*, forward-looking, side-looking, or rear-looking), as is the case in existing rules.

8. The following tables show the current FCC limits and Toyota's requested limits:

Average emission limit in dBm			Average emission limit in $\mu W/cm^2$ at 3m	
	FCC (current)	Toyota Proposed	FCC (current)	Toyota Proposed
Not-in-Motion	23.5	50	0.20	88
In-Motion Front	48.3		60	
In-Motion Side/Rear	45.3		30	

(...continued from previous page)
radar systems, and Section 15.253(b)(1) which requires reduced operating power when a radar is not in motion. The Era petition seeks to create permanent rules somewhat analogous to what was granted in the waiver. Era Systems Corporation Request for Waiver of Sections 2.803, 15.201 and 15.253 of the Commission's Rules, *Order*, ET Docket No. 09-55, 24 FCC Rcd 12179 (OET, 2009).

[16] *See* TMC petition at page 2.

[17] *See* TMC petition at page 8.

Peak emission limits in dBm				Peak power density limits in μW/cm² at 3m	
	FCC (current)	Toyota Proposed		FCC (current)	Toyota Proposed
Not-in-Motion	43.5	55		20	279
In-Motion Front	68.3			6000	
In-Motion Side/Rear	65.3			3000	

Toyota proposes to consolidate the in-motion, not-in-motion, front, side and rear-looking criterion. Its requested average power density limit of 50 dBm (88 μW/cm² at 3 m) and peak power density limit of 55 dBm (279 μW/cm² at 3m) would be applicable in all directions regardless of the motion status of the vehicle. This is slightly higher than the existing FCC emission limits but is below the current MPE limits for RF safety measured at 3m.[18] Toyota's proposed peak limit of 55 dBm (279 μW/cm² at 3m) is also higher than the existing FCC limits for radars on vehicles not in motion, but is lower than the current peak emission values for in-motion vehicular radars. In addition to the power density levels permitted under Section 15.253, vehicular radar devices are also subject to the RF safety requirements in the Commission's rules, and Toyota does not propose any revisions to that requirement.[19]

9. In its comments, NRAO expresses concern that the increased emission limits that TMC proposes would increase the likelihood of interference to radio astronomy in the affected bands and notes that the vehicular radar systems to date have achieved very low market penetration, making it difficult to assess the overall interference level.[20] NRAO states that vehicular radars operating under the proposed limits have the potential to cause permanent damage to radio astronomy detectors if the beam from one of the vehicular systems were to find its way down or near the bore sight of a radio astronomy antenna. NRAO suggests implementation of coordination zones based on GPS–aware vehicular radar systems to prevent interference and permanent damage to radio astronomy equipment. It also suggests that all vehicular radar systems should be equipped with a readily accessible cut-off switch as reliable means of protecting radio astronomy operations. Lastly NRAO states that insufficient technical basis has been provided by TMC for assessing the interference potential of vehicular radar systems.

10. TMC, in its reply comments, argues against NRAO's request to implement coordination zones that are based on GPS–aware vehicular radar systems.[21] It notes that the peak power limits it proposes are less than the current peak power limits allowed for vehicular radars. TMC also argues that the Commission has already recognized that sharing between automotive radar systems and the radio astronomy service is feasible.[22] It cites an FCC proceeding in 2004 where the Commission considered

[18] *See* 47 C.F.R. § 1.1310 and OET Bulletin Number 65, "*Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields*," (August 1997 Edition 97-01).

[19] Currently, Section 15.253(f) incorporates by reference the RF safety requirements in Sections 1.1307, 2.1091, and 2.1093. In Appendix A to this NPRM, we propose redesignating this provision as Section 15.253(e), but do not propose any substantive revisions to this requirement.

[20] *See* NRAO comments at 2.

[21] *See* TMC reply comments at pages 3-4.

[22] *See* TMC reply comments at 3.

sharing between vehicular radars and RAS operations in the 76-77 GHz band.[23] In that proceeding, the Commission found that because RAS millimeter wave receivers are usually located on high mountains in rural areas where access to RAS telescopes is controlled at distances of at least one kilometer, the likelihood of line-of-sight interference is remote. Additionally, the number of millimeter wave observatories is expected to remain limited, and should new RAS facilities be constructed in the future, interference mitigation can be accomplished through the erection of fences and other local shielding.

11. MBUSA, in its reply comments, disagrees with NRAO's concern that the proposed limits have the potential to interfere with and damage radio astronomy detectors.[24] MBUSA states that it is not aware of any vehicular radars causing harmful interference to any U.S. radio telescope operations during the decade-long operation in the United States of Mercedes vehicles equipped with such systems. TMC also disagrees with NRAO's interference concerns given that the radio astronomy antenna are pointed upward and vehicular radar beams are close to parallel to the horizon (approximately zero degrees or slightly above the horizon).

12. We believe there is merit to TMC's request to modify the emissions limits for vehicular radar systems, and to eliminate the "in-motion" and "not-in-motion" distinction in limits for millimeter wave vehicular radar systems. We therefore are proposing to modify our rules for vehicular radar systems operating in the 76-77 GHz band as TMC requests. We propose to modify section 15.253 to increase the average power density limit to 50 dBm (88 $\mu W/cm^2$ at 3 m) and decrease the peak power density limit to 55 dBm (279 $\mu W/cm^2$ at 3m) for vehicular radar systems regardless of the illumination direction of the vehicular radar system as reflected in the proposed rules set forth in Appendix A. We seek comments on this proposal. The proposed emission limits would extend to vehicular radar systems illuminating in any of the above mentioned directions (forward, rear or side). This action would make the rules governing the vehicular radar emission limit in United States to be more comparable to those set forth outside United States and therefore benefit the automotive industry in terms of new product development and cost reduction.

13. As discussed above, the existing separate in-motion and not-in-motion emission limits were adopted to prevent unnecessary and prolonged harmful human exposure to RF radiation. The motion status of the vehicle was given special consideration due the fact that vehicles that are not in motion could result in human exposure to radiation for longer time durations than a moving vehicle. However, because the proposed emission limit of 88 $\mu W/cm^2$ is below the current average threshold limit of 1 mW/cm^2 adopted for human exposure to RF radiation, the in-motion and not-in-motion criteria become unnecessary for safety purposes. We are therefore proposing emission limits independent of the motion status of the vehicle. We seek comments on these proposals.

14. In proposing the new emission limit, we recognize NRAO's concerns about possible interference, but note that the peak limit recommended by Toyota is lower than the current peak limit. This reduced limit will increase the level of interference protection afforded to RAS systems and other authorized users of the 76-77 GHz band. We agree with TMC's assessment that there is very little likelihood that vehicular radar systems operating at either the current or proposed limits would cause harmful interference to radio astronomy equipment. Accordingly, we believe that there is no need to restrict vehicular radar systems based on coordination zones or to impose requirements for a GPS-aware automatic cut-off switch as proposed by NRAO. We invite comment on this analysis.

[23] *See* Amendment of Part 2 of the Commission's Rules to Realign the 76-81 GHz band and the Frequency Range Above 95 GHz Consistent with International Allocation Changes, *Report and Order*, ET Docket No. 03-102, 19 FCC Rcd 3212 (2004).

[24] *See* MBUSA reply comments at 2.

15. We also seek comment on TMC's request to modify Section 15.253 to specify a limit on peak EIRP instead of average power density as an alternative to, or in addition to, the limits currently specified in the rules. Furthermore, we are proposing to modify Section 15.35(b) to reflect the fact that the proposed peak emission limit is not 20 dB above the average emission limit.[25]

16. Era Petition for Rulemaking. In its petition, Era requests that the Commission amend Section 15.253 of its rules to permit the use of 76-77 GHz unlicensed fixed radars at airports for monitoring terrestrial vehicle movements.[26] Era contends that when the rules limiting operation to vehicle-mounted radars were adopted, there was no practical experience with vehicular radars in the 76-77 GHz band, and the rules were made very conservative to assure that such radars would not receive interference from other users of the band. Era contends that subsequent experience in other countries has shown that the requirement that radars operate only on moving vehicles is overly restrictive. It requests that the Commission relax this requirement and suggests several alternative approaches for modifying the rule to allow fixed radar use, primarily at airports. The suggested approaches are: 1) limit fixed radars to airports and other applications that do not illuminate public roads; 2) require either compliance with the ETSI standard[27] or strict compatibility testing for any system that illuminates public roads; or 3) mandate compliance with the ETSI standard for all 76 GHz radar systems. Era does not express a preference for which of these approaches it believes the Commission should adopt.

17. We agree with Era that the current rules should be relaxed to allow the operation of fixed radars in the 76-77 GHz band on an unlicensed basis. We are therefore proposing to permit fixed radars to operate in the 76-77 GHz band in addition to vehicular radar systems, and to require that such fixed radar systems meet the proposed limits for vehicular radar systems discussed above as well as the maximum permissible RF exposure levels set forth in the rules.[28] We believe that, based on Era's representations, use of the fixed radar devices in this band will enhance public safety by enabling applications such as monitoring vehicles on the ground at airports. However, we are not proposing to limit operation to monitoring vehicles or to specific locations such as airports or other places where fixed radars would not illuminate public roads. We believe that Era's suggested alternative approaches and proposals may be overly restrictive and could cause unnecessary burdens for the public if implemented. Implementation of certain elements of these approaches could require licensing and/or coordination that would be burdensome for both users of the devices and the Commission with no corresponding benefits in terms of reduction of interference potential to licensed services or improved co-existence between unlicensed devices. Our proposal to permit fixed radar applications is less restrictive and could be more beneficial to public than the proposals requested by Era. We believe that fixed radars operating at the same maximum power levels as vehicle-mounted radars will be less likely to interfere with the RAS and Radiolocation services than vehicle-mounted radars because the location where they are used would not change. We also believe that fixed radars should be able to co-exist with vehicular radars because they would both operate with the same power level and because both would use antennas with narrow beamwidths, thus reducing the chances that the signal from one radar would be within the main lobe of the receive antenna of the other. In a worst case scenario where two radars are aimed directly at each

[25] *See* 47 C.F.R. § 15.35(b). This section states that, unless otherwise specified, the peak limit on radio emissions above 1 GHz is 20 dB greater than the average limit. Because we are proposing to modify Section 15.253(b) to specify a peak emission limit that is less than 20 dB above the average limit, we are also proposing to modify Section 15.35(b) to indicate that the 20 dB peak to average limit does not apply to Section 15.253(b).

[26] *See* Era comments in ET Docket 10-28.

[27] *See* "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; Part 1: Technical characteristics and test methods for radar equipment operating in the 76 GHz to 77 GHz range", EN 301 091 Ver. 1.3.3

[28] *See* 47 C.F.R. §§ 1.1307(b), 2.1091 and 2.1093.

other, a fixed radar should have no more impact on a vehicular radar system than another vehicular system would.

18. We seek comment on whether we should allow unlicensed fixed radar applications to operate within the 76-77 GHz band, and on the appropriateness of the proposed power levels. We also seek comment on whether there is a need to limit fixed radar applications to specific locations such as airports and/or locations where they are not aimed at publicly accessible roads as suggested by Era, or if some alternative criteria would be more appropriate. Commenters who recommend operational restrictions such as these should also address how they could be practically enforced for unlicensed devices. In addition, we seek comment on whether specific technical requirements are necessary to allow co-existence of fixed and vehicular radars in the 76-77 GHz band (*e.g.,* antenna height, operational frequency or power limits), and whether we should require fixed or vehicular radars to comply with a standard such as the ETSI EN 301 91 standard referenced by Era.

IV. PROCEDURAL MATTERS

A. Ex Parte Rules – Permit-But-Disclose

19. This is a permit-but-disclose notice and comment rulemaking proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed pursuant to the Commission's rules. [29]

B. Comment Period and Procedures

20. Pursuant to sections 1.415 and 1.419 of the Commission's rules 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/ or the Federal eRulemaking Portal: http://www.regulations.gov.

- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

[29] *See generally* 47 C.F.R. §§ 1.1202, 1.1203, 1.1206.

- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

C. Initial Regulatory Flexibility Analysis

21. As required by the Regulatory Flexibility Act of 1980 (RFA), [30] the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules proposed in the Notice. The IRFA is found in Appendix B. We request written public comment on the analysis. Comments must be filed in accordance with the same deadlines as comments filed in response to the Notice, and must have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this Notice, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration.

D. Paperwork Reduction Analysis

22. This document does not contain a proposed information collection(s) subject to the Paperwork Reduction Act of 1995 (PRA, Public Law 104-13. In addition, therefore, it does not contain any new or modified information collection burden for small business concerns with fewer than 25 employees, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4).

E. Further Information

23. For further information regarding this Notice of Proposed Rulemaking, please contact Aamer Zain, Spectrum Policy Branch, Policy and Rules Division, Office of Engineering and Technology, Federal Communications Commission, 445 12th Street, S.W., Washington, DC 20554, at 202-418-2437 or via the Internet at Aamer.Zain@fcc.gov.

V. ORDERING CLAUSES

24. Accordingly, IT IS ORDERED, pursuant to Sections 1, 2, 4(i), 301, 302, and 303(f) of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 301, 301, and 303(f), that this Notice of Proposed Rulemaking is hereby ADOPTED.

[30] *See* 5 U.S.C. § 603.

25. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Notice of Proposed Rulemaking, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Proposed Rules

For the reasons set forth in the preamble, the Federal Communications Commission proposes to amend Part 15 of Title 47 of the Code of Federal Regulations as follows:

Part 15 – RADIO FREQUENCY DEVICES

1. The authority citation for Part 15 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, 304, 307, 336 and 544a.

2. Section 15.35 is amended by revising paragraph (b) to read as follows:

§ 15.35 Measurement detector functions and bandwidths.

* * * * *

(b) Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz. When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, *e.g.*, see §§ 15.250, 15.252, 15.253 (b), 15.255, and 15.509–15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device, *e.g.*, the total peak power level. Note that the use of a pulse desensitization correction factor may be needed to determine the total peak emission level. The instruction manual or application note for the measurement instrument should be consulted for determining pulse desensitization factors, as necessary.

* * * * *

3. Section 15.253 is revised to read as follows:

§ 15.253 Operation within the bands 46.7–46.9 GHz and 76.0–77.0 GHz.

(a) Operation within the band 46.7–46.9 GHz is restricted to vehicle-mounted field disturbance sensors used as vehicle radar systems. The transmission of additional information, such as data, is permitted provided the primary mode of operation is as a vehicle-mounted field disturbance sensor. Operation under the provisions of this section is not permitted on aircraft or satellites.

(1) The radiated emission limits within the bands 46.7–46.9 GHz are as follows:

(i) If the vehicle is not in motion, the power density of any emission within the bands specified in this section shall not exceed 200 nW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.

(ii) For forward-looking vehicle mounted field disturbance sensors, if the vehicle is in motion the power density of any emission within the bands specified in this section shall not exceed 60 μW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.

(iii) For side-looking or rear-looking vehicle-mounted field disturbance sensors, if the vehicle is in motion the power density of any emission within the bands specified in this section shall

not exceed 30 μW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.
(iv)The provisions in § 15.35 limiting peak emissions apply.

(b) Operation within the band 76.0–77.0 GHz is restricted to vehicle-mounted field disturbance sensors used as vehicle radar systems and to fixed radar systems. The transmission of additional information, such as data, is permitted provided the primary mode of operation is as a vehicle-mounted field disturbance sensor or as a fixed field disturbance sensor. Operation under the provisions of this section is not permitted on aircraft or satellites.

1) The radiated emission limits within the bands 76.0–77.0 GHz are as follows:
(i) The average power density of any emission within the bands specified in this section shall not exceed 88 μW /cm^2 at a distance of 3 meters from the exterior surface of the radiating structure.
(ii) The peak power density of any emission within the bands specified in this section shall not exceed 279 μW /cm^2 at a distance of 3 meters from the exterior surface of the radiating structure.

(c) The power density of any emissions outside the operating band shall consist solely of spurious emissions and shall not exceed the following:
(1) Radiated emissions below 40 GHz shall not exceed the general limits in § 15.209.
(2) Radiated emissions outside the operating band and between 40 GHz and 200 GHz shall not exceed the following:
(i) For field disturbance sensors operating in the band 46.7–46.9 GHz:
2 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.
(ii) For field disturbance sensors operating in the band 76–77 GHz:
600 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.
(3) For radiated emissions above 200 GHz from field disturbance sensors operating in the 76–77 GHz band: the power density of any emission shall not exceed 1000 pW/cm² at a distance of 3 meters from the exterior surface of the radiating structure.
(4) For field disturbance sensors operating in the 76–77 GHz band, the spectrum shall be investigated up to 231 GHz.

(d) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to +50 degrees Celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

(e) Regardless of the power density levels permitted under this section, devices operating under the provisions of this section are subject to the radiofrequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

APPENDIX B

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in this Notice of Proposed Rule Making (NPRM). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines specified in the NPRM for comments. The Commission will send a copy of this NPRM, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the NPRM and IRFA (or summaries thereof) will be published in the Federal Register.[3]

A. Need for, and Objectives of, the Proposed Rules

2. This NPRM responds to petitions for rulemaking filed by Toyota Motor Corporation ("TMC") and Era Systems Corporation ("Era") requesting modifications to Section 15.253 of the rules for vehicular radar systems operating in the 76-77 GHz band. Vehicular radars can determine the exact distance and relative speed of objects in front of, beside, or behind a car to improve the driver's ability to perceive objects under bad visibility conditions or objects that are in blind spots. Some examples of vehicular radar systems include collision warning and mitigation systems, blind spot detection systems, lane change assist and parking aid systems. The NPRM proposes to eliminate the requirement that vehicular radars decrease power when the vehicle on which the radar is mounted is stopped, or not in motion, and to expand the use of unlicensed 76-77 GHz band radars to fixed infrastructure systems. These modifications to the rules will provide more efficient use of spectrum, and enable the automotive and fixed radar application industries to develop enhanced safety measures for drivers and the general public.

B. Legal Basis

3. This action is authorized under Sections 1, 4(i), 302, 303(f) and (r), 332, and 337 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 1, 4(i), 154(i), 302, 303(f) and (r), 332, 337.

C. Description and Estimate of the Number of Small Entities to Which the Proposed Rule Will Apply

4. The RFA directs agencies to provide a description of, and, where feasible, an estimate of, the number of small entities that may be affected by the rules adopted herein.[4] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[5] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[6] A "small business concern" is one

[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, (SBREFA) Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] *See* 5 U.S.C. § 603(a).

[3] *See* 5 U.S.C. § 603(a).

[4] 5 U.S.C. § 604(a)(3).

[5] 5 U.S.C. § 601(6).

[6] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity (continued....)

which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[7]

5. ***Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing.*** The Census Bureau defines this category as follows: "This industry comprises establishments primarily engaged in manufacturing radio and television broadcast and wireless communications equipment. Examples of products made by these establishments are: transmitting and receiving antennas, cable television equipment, GPS equipment, pagers, cellular phones, mobile communications equipment, and radio and television studio and broadcasting equipment."[8] The SBA has developed a small business size standard for Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing, which is: all such firms having 750 or fewer employees.[9] According to Census Bureau data for 2002, there were a total of 1,041 establishments in this category that operated for the entire year.[10] Of this total, 1,010 had employment of under 500, and an additional 13 had employment of 500 to 999.11 Thus, under this size standard, the majority of firms can be considered small.

D. Description of Projected Reporting, Record Keeping, and Other Compliance Requirements

6. Radars operating in the 76-77 GHz band are required to be authorized under the Commission's certification procedure as a prerequisite to marketing and importation, and the NPRM proposes no change to that requirement. However, it proposes to eliminate the requirement that a radar must reduce power when a vehicle is not in motion and to establish a single emission limit that applies in all directions from a vehicle. The NPRM also proposes to permit fixed radars to operate in the 76-77 GHz band under the same limits proposed for vehicular radar systems.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

7. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design,

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for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[7] 15 U.S.C. § 632.

[8] U.S. Census Bureau, 2002 NAICS Definitions, "334220 Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing"; http://www.census.gov/epcd/naics02/def/NDEF334.HTM#N3342.

[9] 13 C.F.R. § 121.201, NAICS code 334220.

[10] U.S. Census Bureau, American FactFinder, 2002 Economic Census, Industry Series, Industry Statistics by Employment Size, NAICS code 334220 (released May 26, 2005); http://factfinder.census.gov. The number of "establishments" is a less helpful indicator of small business prevalence in this context than would be the number of "firms" or "companies," because the latter take into account the concept of common ownership or control. Any single physical location for an entity is an establishment, even though that location may be owned by a different establishment. Thus, the numbers given may reflect inflated numbers of businesses in this category, including the numbers of small businesses. In this category, the Census breaks-out data for firms or companies only to give the total number of such entities for 2002, which was 929.

[11] *Id*. An additional 18 establishments had employment of 1,000 or more.

standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[12]

8. The proposals contained in this NPRM are deregulatory in nature, which we expect will simplify compliance requirements for all parties, particularly small entities, and permit the development of improved radar systems. Elimination of requirement for a radar to reduce power when a vehicle is not in motion will simplify equipment design, and establishment of a single emission limit that applies in all directions from a vehicle would allow the development of omni-directional monitoring systems. Permitting fixed radar devices in the 76-77 GHz band would enable the development of applications such as monitoring the movement of vehicles on the ground at airports.

F. Federal Rules that May Duplicate, Overlap, or Conflict With the Proposed Rule

9. None.

[12] *See* 5 U.S.C. § 603(c).