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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

September 1, 1993

BY HAND DELIVERY

Mr. William Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: Request for Rulemaking by General Motors Research Corporation, RM No. 8308

Dear Mr. Caton:

On behalf of VORAD Safety Systems, Inc. ("VORAD"), we are filing herewith the original and nine (9) copies of the attached Comments to General Motors Research Corporation's Petition for Rulemaking to amend Parts 2 and 15 of the Commission's Rules to permit use of the 76-77 GHz band for vehicle radar systems (RM. 8308).

Please address any questions concerning this matter to the undersigned.

Respectfully submitted,

HOGAN & HARTSON

By _____
Susan Wing
Christopher P. Gilkerson

cc: Thomas P. Stanley, Chief Engineer
Office of Engineering and Technology

Richard B. Engelman, Chief
Technical Standards Branch

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Federal Communications Commission

WASHINGTON, D. C.

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In re Request for Rulemaking by	)	
	)	RM No. 8308
General Motors Research Corporation	)	

To: Office of Engineering and Technology

COMMENTS OF VORAD SAFETY SYSTEMS, INC.

VORAD Safety Systems, Inc. ("VORAD"), a subsidiary of IVHS Technologies, Inc., by its attorneys, hereby submits the following comments in response to the Petition for Rulemaking in the captioned proceeding.

I. Introduction

VORAD is the first company in the United States to produce and market a radar-based driver alert safety system ("vehicle radar safety system"). VORAD (including its predecessors) has more than twenty years of experience in researching and developing vehicle radar safety systems, and has installed the system in approximately 1800 commercial vehicles, including the nation's largest commercial bus fleet, owned by Greyhound Lines, Inc. VORAD continues to develop its radar technology through cooperative undertakings among the private sector, research universities, and the government. 1/ In February 1993, VORAD announced the formation of a global joint venture with Eaton Corporation and a

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1/ VORAD is now working with the University of Southern California, with funding from the California Department of Transportation, to develop and test algorithms for the design of "Intelligent Cruise Control" systems that link radar tracking to cruise control mechanisms.

consortium, including M-A/COM, Allstate Insurance Co., and AIL Systems, to concentrate on the continued development of vehicle radar safety systems. Currently, the front-end microwave antenna unit of VORAD's "T-200 Radar" operates at 24.125 GHz. 2/ Pending before the Commission staff is a waiver request to enable the radar system to operate at 24.725 GHz. 3/

Based on its perspective as the only U.S. company already marketing a forward-looking vehicle radar safety system, VORAD generally supports the rationale underlying the Petition for Rulemaking filed by General Motors Research Corporation ("GM Petition"). In particular, VORAD agrees that at some point in the near future the Commission will need "to establish regulations, measurement standards and a frequency assignment" for intelligent vehicle and highway systems ("IVHS") radar technologies. 4/ In this respect, GM's Petition is a request for the Commission to begin a process of review and deliberation. VORAD also agrees that future technological applications for both GM and VORAD radars will likely include crash-avoidance systems, or autonomous cruise control and braking systems, which will improve greatly the efficiency and safety of the operation of motor vehicles through automatic "headway keeping," the constant maintenance of safe distances between vehicles. 5/ Thus, the ultimate goal will be to enable the use of vehicle

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2/ Upon sensing a potential hazard, the T-200 Radar gives the driver a combination of visual and audible warnings, thereby providing the driver with a significant margin of additional time to apply the brakes or take other evasive action.

3/ VORAD is opposed to any action by the Commission in this proceeding that would result in eliminating previously granted spectrum for use by field disturbance sensors or that would effect VORAD's pending waiver request.

4/ GM Petition at 2.

5/ See id. at 4.

radar safety systems in virtually every vehicle operating on the roads and highways of this country.

II. The Commission Should Conduct Additional Factfinding Regarding IVHS Technologies and Appropriate Technical Requirements and Regulatory Structure Before Assigning Spectrum

At this point in time VORAD believes it would be premature for the Commission to begin a rulemaking to consider only assignment of a single frequency without first considering (1) the full range of potential uses of IVHS technologies, (2) whether other frequency bands offer additional advantages in light of these potential uses, and (3) the corresponding appropriate technical requirements and regulatory structure to govern the broad spectrum of IVHS technologies. A more prudent course of action would be to issue a notice of inquiry to enable additional factfinding, and then to expand the scope of any future proposed rulemaking to include technical requirements and regulatory structure.

As the GM Petition makes clear, GM itself is still 2-3 years away from marketing its own "initial application" of a vehicle radar safety system, which would be identical in purpose to VORAD's currently marketed system: to alert the driver of a truck, recreation vehicle, or bus of potentially hazardous situations in the path of the vehicle. 6/ Perhaps this explains GM's concentration only on its own preferred spectrum location and technical needs, and the absence of any broader analysis regarding the current and future applications and needs of the public and other IVHS technology developers. A broader analysis, necessary before considering a rulemaking, must include specific consideration of the appropriate regulatory structure and licensing scheme for radar technologies, which have

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6/ Id. at 2, 5.

potential application in literally hundreds of thousands of vehicles. VORAD believes it is critical for the Commission to consider all future implications of the issue before instituting a rulemaking to permanently allocate spectrum to vehicle radar safety systems. As the Commission well recognizes, regulatory structure and technical requirements are directly related to spectrum allocation, especially in this age of increasing spectrum congestion and rapidly advancing frequency-dependent technologies.

III. The Commission Should Consider Alternatives to 76-77 GHz

Like GM, a focus of VORAD's current research and development efforts is on reducing the size of the radar antenna unit to enable its effective use and design for the consumer automobile market. 7/ The shared goal of reducing antenna size, however, says little about the most appropriate permanent spectrum allocation. In fact, GM's Petition discloses that GM has selected the 76-77 GHz spectrum solely because it desires to produce a common product for both its U.S. and European markets. 8/ Thus, GM has tied its legitimate private interests to a proposal by the Council of European Communities to allocate the 76-77 GHz band "for radar and future road transport telematic systems" in Europe. 9/ The GM

7/ See id. at 5. Up to a point, in general, the size of the antenna is inversely proportional to frequency.

8/ Id. at 6.

9/ Id. at 3.

Petition does not articulate any independent U.S. public interest supporting adherence to the European proposal. 10/

Although limited research by GM has revealed that existing uses in the 76-77 GHz band "will not represent a bar to" GM's proposed use, the Petition makes no comment on -- much less an assessment of -- other possible locations. 11/ VORAD submits that the Commission should consider other possible permanent assignments, keeping in mind that in the not too distant future there is the potential that every vehicle on the road will incorporate some form of IVHS technology. Currently VORAD, GM, and other companies are using a number of experimental licenses (most filed on a confidential or business proprietary basis) at several frequencies to test and develop a variety of vehicle radar systems. Analysis of data from these experiments prior to proposing a single specific allotment is necessary for understanding the unique needs of vehicles traversing domestic highways and roads, and thus should inform the Commission's decisions and public comment on these issues.

Current experimental licenses allow testing in a range of bands from 24 to 94 GHz, many of which may offer advantages over GM's proposal for 76-77 GHz. 12/ For example, at lower frequencies there is less frequency drift requiring

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10/ From the American commercial perspective, a unique U.S. allotment different from a European allotment would deter domestic market penetration from abroad, thereby promoting an independent American industry, and incrementally assisting with the U.S. balance of trade.

11/ Id. at 8.

12/ For example, he Japanese government is considering permanent allocation for forward-looking vehicle radars in the 59-60 GHz band. Given that Japanese automakers hold a much greater percentage of the U.S. market than do European automakers, from a U.S. consumer's perspective an allocation around 60 GHz may make more sense than 76-77 GHz.

less bandwidth allocation. Moreover, in general there is additional environmental attenuation at higher frequencies. Additionally, VORAD estimates that at present a transmitter operating at a frequency lower than 76.5 GHz would cost orders of magnitude less to produce, given the current availability of components. Because the public interest in safer highways depends on the future mass availability of vehicle radar safety systems, the cost of the radar unit to the ultimate consumer is an additional public interest factor the Commission should consider. 13/

IV. The Commission Should Consider Technical Requirements and Appropriate Regulatory Structure in the Course of Assigning Spectrum

GM submits that because of its "proprietary modulation scheme" there "is near zero probability that two of [its] radars will interfere with each other." 14/ However, tests in a controlled setting on GM's proving grounds between two of GM's own radars resulting in a "near zero" chance of interference are sufficient merely for GM's own immediate needs. Those limited tests are a wholly insufficient basis on which to determine the public interest in future requirements and regulations for vehicle radar safety systems and in the most appropriate frequency allocation. For example, GM's Petition discusses only the potential for causing interference and ignores the equally important issue that, under Part 15, vehicle radar safety systems (classified as "field disturbance sensors") must accept all interference. 15/ Although this basic Part 15 condition of operation is satisfactory with respect to the current generation of vehicle radar safety systems, which simply alert the driver of

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13/ Although VORAD recognizes the necessity of smaller antenna size for reasons of commercial attractiveness and aesthetic design, such concerns should be balanced against the increased costs of production at 76.5 GHz.

14/ Id. at 9.

15/ 47 CFR § 15.5(b).

potential hazards, such a condition may be ill-advised with respect to the next generation of radar systems, which will maintain at least partial, automatic control over vehicular braking and acceleration. GM's petition, though anticipating the rapid changes in technology and viable applications over the next few years, does not address this fundamental issue.

To consider fully the public's obvious interest in the application and near-term availability of vehicle radar safety systems, and in order to stay abreast of this rapidly advancing technology, VORAD submits that the Commission should begin now to consider the appropriate basis for future regulation before it permanently allocates spectrum. The Commission recently took such a far-sighted approach to interactive video and data technologies, allocating spectrum, defining operational requirements, and establishing a regulatory structure as part of the same rulemaking proceeding to establish a new personal radio service under Part 95 of the Rules. 16/ In that proceeding, in addition to spectrum allocation, the Commission considered and determined power limitations, field strengths, interference potential, antenna specifications, emissions type, interference prevention, conditions on use, and licensing requirements and procedures.

Although the Commission heretofore has considered vehicle radar safety systems as "field disturbance sensors" under Part 15, the prospect and great public benefits of equipping hundreds of thousands of vehicles with a radar safety system may require establishment of a dedicated radio service not subject to Part 15 restrictions. Vehicle radars, in effect, constitute a mobile point-to-same-point

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16/ See Amendment of Parts 0, 1, 2, and 95 of the Commission's Rules to Provide Interactive Video and Data Services, 7 FCC Rcd 1630 (1992). In IVDS, after the original petition for rulemaking the Commission carefully considered relevant issues for over three years before issuing a Notice of Proposed Rulemaking. See id. at ¶¶ 2-3.

communication system, with transmitter and receiver located in the same source. Currently, such units provide information to aid the driver in braking and acceleration functions. As part of a future system to maintain automatically a proper distance between vehicles on the roads and highways, vehicle radars will constitute a form of communication between vehicles greatly enhancing public safety and welfare by further reducing the risk and costs of accidents. Surely the public interest, convenience, and necessity in the continued development and proper future regulation of vehicle radar safety systems is as great as some existing radio services, such as the Radio Control (R/C) Service, 17/ and is greater than proposed radio services the Commission has rejected in the past. 18/

V. Conclusion

Before initiating a rulemaking proceeding to assign permanently frequency for the next generation of vehicle radar safety systems, the Commission should undertake additional factfinding regarding current and future uses of IVHS technologies and the corresponding appropriate technical requirements and regulatory structure. Such factfinding could take the form of a notice of inquiry or an expansion of GM's initiative to include the issues outlined above. VORAD shares GM's goal in beginning the process of careful Commission deliberation to determine the most beneficial regulation of vehicle radar safety systems, which hold

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17/ See 47 CFR §§ 95.201-.225. As the Commission has recognized with both the Radio Control Service and the Citizens Band Service, individual licensing of users is not a prerequisite to establishment or continuation of a service under the Commission's rules. See In re Amendments of Parts 1 and 95 of the Commission's Rules to Eliminate Individual Station Licenses in the Radio Control (R/C) and Citizens Band (CB) Radio Services, 53 RR 2d 1479 (1983).

18/ See, e.g., Creation of an Additional Private Radio Service, 57 RR 2d 559 (1984) (concluding that allocation of spectrum for new mobile radio service not in public interest in light of other uses of identified spectrum).

tremendous potential for enhancing public safety and for becoming standard safety equipment in every vehicle traveling the roads and highways of this country. By taking a broad, holistic approach to the issues raised by the GM Petition, the Commission will best serve the interests and needs of the public.

Respectfully submitted,

VORAD Safety Systems, Inc.

By _____
Susan Wing
Christopher P. Gilkerson

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Its Attorneys

September 1, 1993

CERTIFICATE OF SERVICE

The undersigned hereby certifies that copies of the foregoing **COMMENTS OF VORAD SAFETY SYSTEMS, INC.** have been mailed by United States mail, first class, postage prepaid, this 1st day of September, 1993 to the following:

Lois A. Williams
Vice President
General Motors Research Corporation
12-121 General Motors Building
3044 West Grand Boulevard
Detroit, MI 48202

By Gayle H. Hall
Gayle H. Hall

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