

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Amendment of Parts 1, 2, 15, 90 and 95 of the Commission's Rules to Permit Radar Services in the 76-81 GHz Band)	ET Docket No. 15-26
)	
Amendment of Part 15 of the Commission's Rules to Permit the Operation of Vehicular Radar Services in the 77-78 GHz Band)	RM-11666
)	
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
)	
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
)	
Amendment of the Commission's Rules to Permit Radiolocation Operations in the 78-81 GHz Band)	

To: The Commission

**REPLY COMMENTS OF ARRL,
THE NATIONAL ASSOCIATION FOR AMATEUR RADIO**

ARRL, the national association for Amateur Radio, formally known as the American Radio Relay League, Incorporated (ARRL), by its Chief Technology Officer and pursuant to Section 1.415 of the Commission's Rules (47 C.F.R. §1.415), hereby respectfully submits its reply to certain of the comments filed in response to the *Notice of Proposed Rule Making and Reconsideration Order*, FCC 15-16, 80 Fed. Reg. 12120, released February 5, 2015 (the Notice). In the process of accommodating the development of and to authorize radar applications in the 76-81 GHz band in the United States, it is unnecessary to disrupt ongoing and future Amateur Radio use of this band, and the comments that suggest otherwise are uninformed. For its reply

comments, and in the interests of the Amateur Radio Service in continued access to and effective use of the band 77-81 GHz, ARRL states as follows:

I. Suspension of Amateur Radio from the 77-81 GHz Band is not Supported by Evidence in the Record and is Contrary to Current Commission Policy on Millimeter Wave Spectrum.

To those who may not be comfortable with expanding our horizons in this way, I challenge you not to say “no” even before we start down this road. Be a part of the community that makes this happen, the community that says “yes” to new frontiers of spectrum use.

FCC Chairman Tom Wheeler, Statement on millimeter wave Notice of Inquiry,
October 17, 2014

1. Chairman Wheeler issued this challenge upon the Commission’s initiation of a comprehensive inquiry into the use of the frequencies under consideration here.¹ In doing so, he challenged incumbent allocation holders not to reject new uses of millimeter wave spectrum out of hand, and to consider advances of technology and sharing techniques made possible in part by the generally short-range propagation characteristics at these frequencies.²

2. ARRL didn’t wait for Chairman Wheeler to issue this challenge to actually take it up with respect to the 77-81 GHz band. ARRL conducted extensive discussions and technical evaluations with Bosch in advance the latter’s Petition for Rulemaking in this proceeding. ARRL was present and engaged at WRC-12 when Resolution 654 was adopted.³ ARRL was present and engaged during the development of the ITU technical studies called for by Resolution 654, which ultimately led to the conclusion in Report ITU-R M.2322-0 that incumbent amateur operation and short range vehicular radar as proposed by Bosch are compatible at 77-81 GHz.⁴

¹ NPRM&RO at ¶4 (“These bands are in the region of the radiofrequency spectrum known as “millimeter wave” spectrum.”).

² See *id.*

³ See *Bosch Petition*, at Exhibit A (reprinting Resolution 654, which was unanimously adopted at WRC-12 and that proposes the allocation of the 77.5-78 GHz band to the radiolocation service to support vehicular SRR operations)

⁴ See *ARRL Comments* in this proceeding, at Exhibit B (filed April 6, 2015).

ARRL is comfortable with and has embraced this conclusion. In short, even before the Chairman issued his challenge to millimeter wave incumbents, ARRL has walked the walk.

3. ARRL now expects the Commission to do more than talk the talk in this segment of the millimeter wave spectrum. The Commission cannot follow the suggestions of some industry commenters—none of whom have engaged in the relevant ITU studies to the extent to which both Bosch and ARRL have⁵—to exclude Amateur Radio from the 77-81 GHz segment in light of the thoroughly vetted and adopted study on record. To do so based only upon an assertion of “potential interference conflicts,” in the absence of *any* evidence of such in the record of this proceeding or prior related proceedings, would be an abdication of critical analysis indicative of a lack of reasoned decision making.

4. The comments of Continental, Delphi, and the Former SARA—from which the petitioner that sought this proceeding, Bosch, has tellingly disassociated itself—cite no actual evidence, either in practice or theory, of Amateur Radio, as it is practiced in the 77-81 GHz band, being incompatible with short range vehicular radar in the same frequency range. Bosch, in fact, based on extensive discussions with ARRL and the studies contained in ITU-R Report M.2322-0, makes the opposite conclusion.⁶ Bosch is correct, and is supported by actual evidence in the record.

5. In contrast, the Former SARA states that “the findings [sic] of the Commission and European regulators” with respect to Amateur Radio compatibility with automotive radar

⁵ The lack of prior engagement of Caterpillar, Continental, Delphi, General Motors, and the members of the Former SARA Group is starkly illustrated by their individual and collective failures to cite ITU-R Report M.2322-0 in their comments in this proceeding. Candidly, the omission of this study from an automotive industry participant’s comments in this proceeding reflects a surprising degree of unfamiliarity with the subject.

⁶ *Bosch Comments* in this proceeding ¶21, filed April 6, 2015:

The definitive ITU study and Bosch’s independent technical analysis establishes that there is compatibility in this frequency range between automotive radar, radioastronomy and amateur radio. That ITU report should be considered determinative of the compatibility issue as between automotive radar on the one hand and incumbent radio services on the other.

“should be considered.” The Former SARA cites the 2004 Report and Order in Docket 03-102⁷ as a source of “evidence” of incompatibility between Amateur and Amateur-Satellite Service operations and LRRs at 76-77 GHz. The Commission’s action was based solely upon conjectural concerns about potential interaction. Further, the Commission specifically held that because the Amateur Service had full access to the entirety of the 77-81 GHz band, there was no substantial burden on the Amateur Service from continuing the suspension at 76-77 GHz:

We continue to find that not allowing amateur operations in the 76-77 GHz band is not a significant burden on this service because amateurs typically do not operate at these higher frequencies and they are permitted to operate in the adjacent 77-81 GHz band.⁸

Thus, the Commission continued the suspension of Amateur Radio operation at 76-77 GHz during the time that LRRs were developing in the 76-77 GHz band, not because of an affirmative finding of interference potential but instead because of the absence in 2004 of criteria to address unspecified “potential sharing problems.” Such criteria, at least in the 77-81 GHz range, are found in 2014’s definitive study of this subject in ITU Report M.2322-0, which the Former SARA fails to address despite it being a decade more recent.⁹

6. Beginning with the its Petition for Rule Making, Bosch has stated affirmatively, based on its own analysis and cooperative work with ARRL over the past five years, that there is compatibility between Amateur Radio operation and automotive radars. The position of Bosch

⁷ *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, 19 FCC Rcd 3212 (2004).

⁸ *Id.* at 3218.

⁹ Further, the Former SARA’s dismissal of Amateur Radio as a “hobby service” contradicts the plain language of the Commission in the instant proceeding (NPRM&RO at ¶24: “[W]e recognize that the millimeter wave bands support numerous beneficial services and incumbent operations”). ARRL is confident that the Commission, which has further previously referred to the Amateur Service as a “priceless public benefit” and “a service that is a model of public responsiveness in times of emergency and distress and a service that is a model of self-enforcement and volunteerism,” is cognizant of the repeated acknowledgements of the continuing value of the Amateur Service in technological development and furtherance of the science of radio. *See, e.g.*, 47 C.F.R. §97.1; Public Law 103-408 (1994); Public Law 100-594 (1988); Public Law 97-259 (1982) (“The contributions of amateur radio operators to our present day communication techniques, facilities, and emergency communications have been invaluable.”).

has to date remained consistent in that respect, and has been verified by the comprehensive analysis of the extent of compatibility between Amateur Radio and automotive radar operations at 77-81 GHz conducted within the ITU. This study definitively establishes the compatibility of automotive radar and Amateur Radio in this band. Bosch's pre-petition work with ARRL, the ITU study, and the comments in this proceeding filed by Bosch, ARRL and some individual radio amateurs active in the band¹⁰ establish that Amateur Radio is in no way incompatible with automotive radar at 77-81 GHz. It remains ARRL's position that there should be no change in the Amateur Radio domestic primary allocation at 77.5-78 GHz, or in the secondary Amateur allocation at 77-77.5 GHz or 78-81 GHz in order to accommodate automotive radar systems at 77-81 GHz. Nor are any additional Part 97 rules necessary to accommodate compatible sharing of that band between radio amateurs and automotive radar systems. ARRL reiterates that such is precisely the position of the United States in anticipation of consideration of WRC-15 agenda item 1.18 later this year.¹¹

7. Compatibility between Amateur Radio and short range vehicular radar exists because of the manner in which Amateur Radio makes use of the band (point-to-point links at high elevations with very narrow beamwidths to overcome propagation difficulties), the manner in which short range vehicular radar will use the band (over ranges of less than 100 meters with antennas pointing toward the ground at minimal output power), and the short range propagation

¹⁰ See, e.g. the comments of Barry Malowanchuk, Gary Lauterbach, Michael Seguin, Robert M. Bownes and Thomas Williams.

¹¹ The United States proposal for WRC-15 Agenda Item 1.18 is that there should be a primary allocation to the radiolocation service for automotive applications in the 77.5-78.0 GHz frequency band in accordance with Resolution 654 (WRC 12). This would result in a co-primary allocation to the radiolocation service and the amateur service at 77.5-78.0 GHz and the continuation of the secondary allocation for the Amateur Service at 76-77.5 GHz and 78-81 GHz. There is no change proposed by the United States for the Amateur or Amateur Satellite Service in this frequency range.

characteristics of this band given conventional operating techniques. The sharing arrangement works, and ITU-R Report M.2322-0 shows that it works.¹²

8. One additional comment in the record needs to be corrected. The comments of the Automotive Safety Council, dated April 2, 2015, but not made available on ECFS until April 14. In these comments, at page 3, ASC mischaracterizes the 77.5-78 GHz band as “formerly amateur radio/satellite”. Such a characterization is at best incorrect, and at worst an inappropriate prejudgment of the outcome of this proceeding. ARRL notes that ASC presents no actual evidence—or even an explicit assertion—of potential incompatibility between short range vehicular radar and Amateur Radio.

II. Conclusion.

9. The Commission, through its Chairman, has challenged incumbent millimeter wave users to approach new uses of and sharing arrangements within the millimeter wave bands with an open mind. Even before the Chairman issued his challenge, ARRL met it with respect to 77-81 GHz band, working with experts in the automotive industry to reach a documented, workable solution. The unfounded concerns of previously unengaged commenters that short range vehicular radar is incompatible with Amateur Radio, based only on fear and not on evidence, are not supported in the record, and are contradicted by studies that have actually been performed and vetted. Unlike these commenters, ARRL (and, to their credit, Bosch) have walked the walk that the Chairman has challenged incumbents in the millimeter waves to walk. The Commission

¹² The absurdity of an assertion of a “potential interference conflict” can be illustrated by the absurdity of the worst-case scenario, which would be a vehicle in the line of sight between two Amateur Radio stations at elevated points. Such a vehicle would necessarily have to be airborne given a typical path between Amateur Radio stations. While the path may graze the earth’s horizon over an atypically long distance between Amateur Radio stations, at such a distance signal strength from the Amateur Radio station would be greatly attenuated compared to the desired return signal of the vehicular radar.

must refrain from suppressing Amateur Radio in the 77-81 GHz band if it is truly committed to its stated millimeter wave policy beyond merely talking the talk.

Therefore, the foregoing considered, ARRL, the national association for Amateur Radio again respectfully requests that the Commission resolve this proceeding in accordance with the recommendations contained in ARRL's comments previously filed in this proceeding and with these reply comments, and not otherwise.

Respectfully submitted,

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By: _____

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April 20, 2015