Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	
	)	
Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band	)	ET Docket No. 02-380
	)	

REPLY OF MSTV AND NAB TO OPPOSITIONS

The Association for Maximum Service Television, Inc. ("MSTV") and the National Association of Broadcasters ("NAB") file this Reply to certain Oppositions and Comments to the Petitions for Reconsideration and Clarification filed in the above-referenced proceedings. MSTV and NAB's Reply focuses in particular on three critical issues: (1) the need to maintain power levels and other operating parameters for TV band devices ("TVBDs") at levels that will protect licensed services and the public that relies on them; (2) the role of a comprehensive, accurate, and secure database in preventing unlawful operation of TVBDs; and (3) the inadequacy of spectrum sensing, particularly at the -114 dBm level adopted in the *Second Report & Order*, as a means of preventing interference to the public's free broadcast service and wireless microphones.

I. POWER LEVELS AND OTHER TECHNICAL PARAMETERS MUST PROTECT THE PUBLIC'S ACCESS TO LICENSED SERVICES.

A. The Commission Should Not Allow Any Increases in the Already High Power Levels for TVBDs.

Ignoring evidence that the power levels already adopted for TVBDs are too high to protect licensed services, a handful of parties ask the Commission to let TVBDs transmit at even higher levels — as much as 20 watts for fixed services and 4 watts for personal/portable

devices.[1] Adoption of these proposals would create vast new "loss areas" leaving consumers without access to over-the-air television, cable, or satellite service, and would prevent the use of wireless microphones that make the production of breaking news, sports, weather, and other programming possible.

Like DIRECTV, the National Cable & Telecommunications Association ("NCTA"), and Shure Inc. ("Shure"), MSTV and NAB urge the Commission to reject any proposal to increase power levels of TVBDs. For example, the Commission should reject Motorola's proposal to allow "vehicle-mounted" personal/portable devices to operate at 4 watts, which would create a significant "roving radius of interference."[2] Similarly, Shure is correct that the Wireless Internet Service Provider Association's ("WISPA") proposal to allow fixed TVBDs to operate at 20 watts would create a "significant risk of harmful interference to all incumbent users" and that "[s]uch high power operations are wholly inconsistent with the principles of Part 15" — namely, that unlicensed devices should operate only when they can protect licensed services.[3]

A recent Georgia Institute of Technology study published by the IEEE illuminates the inadequacy of even the current power limits (*e.g.*, 40 mW for adjacent channel operation) to protect the public's access to over-the-air television and other licensed services. The study

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[1] *See* Consolidated Opposition of WISPA at 11-12 (proposing that fixed TVBDs be allowed to operate at levels of 20 watts); Comments of Carlson Wireless Technologies at 3-4 (supporting WISPA's proposal for high-powered fixed device operation); Opposition of Motorola at 16 (proposing 4 watt personal/portable device operation).

[2] Comments of NCTA at 8. *See also* Opposition of Shure at 11 (stating that vehicle-mounted 4 watt TVBDs would create a zone of interference extending for several miles from the transmitting vehicle, and pointing out that an in-motion TVBD would be unable to satisfy sensing obligations).

[3] *See* Opposition of Shure at 12. *See also* Petition for Reconsideration of SBE at 3.

showed that a personal/portable device operating in excess of 1.5 mW on the first adjacent channel will fail to protect reception of over-the-air broadcasts at the Grade B contour level. Even if the level of protection sought for television reception were relaxed to 7 dB above the Grade B contour, the maximum power to avoid harmful interference would be no higher than 15.1 mW.[4] In light of the documented harm that will result from operation at the power levels adopted in the *Second Report & Order*, at a minimum, the Commission should not exacerbate the problem by increasing power limits for TVBDs.

The power levels adopted in the *Second Report & Order* are particularly inadequate to protect consumers' reception of new mobile television services. Dell/Microsoft ask the Commission to turn a blind eye to this concern because it is an "as yet undefined servic[e] that may never be authorized."[5] The reality is that already, 70 stations in 28 markets have announced that they will broadcast mobile television by the end of 2009 using their existing broadcast licenses, and CE manufacturers are gearing up to market equipment by the end of this year. These stations and others will use the ATSC M/H standard. That standard already has "candidate" status, which is the final step before formal adoption and publication of the standard.[6] If the Commission is to protect this *licensed* service, it will need to adopt power levels based upon evaluation of the effect of TVBD transmissions on reception of mobile broadcasts.

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[4] *See* "Interference Analysis of TV-Band Whitespace," G.L. Stuber, S. M. Almalfouh, D. Sale, *Proceedings of the IEEE*, Vol. 97, No. 4, at p. 752 and Tables 11-12 (April 2009).

[5] Dell/Microsoft Comments at 20.

[6] *See* ATSC Mobile DTV Candidate Standard, www.atsc.org/standards/candidate_standards.php.

B. There Is No Basis for Relaxation of Other Technical Parameters.

Some of the same parties seeking irresponsibly high power levels for TVBDs ask the Commission to expand other operating parameters for TVBDs, and thereby destroy service to others. Again, the Commission should not allow TVBDs to create yet more destructive interference to licensed services; at stake is the Commission's goal that its rules should provide for the use of TVBDs only "without disrupting the incumbent television and other authorized services that operate in the TV bands." [7]

First, the Commission should reject Dell/Microsoft's proposal to allow TVBDs to reduce the one kilometer protective zone around sites registered in the database for wireless microphones.[8] Under the Dell/Microsoft approach, personal/portable devices would operate as close as 100 meters to a protected venue.[9] Yet, as the Commission recognized in adopting the requirement that TVBDs not operate within 1 km of the coordinates of registered wireless microphone sites when wireless microphones are in use, "this separation distance recognizes the fact that wireless microphones and other devices used at an event site will be at relatively strong signal levels compared to unlicensed TVBD signals at that distance and also allows for wireless

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[7] *Second Report and Order and Memorandum Opinion and Order*, ET Docket Nos. 04-186 and 02-380, 23 FCC Rcd 16807 (rel. Nov. 14, 2008), at ¶ 2 ("*Second Report and Order*").

[8] *See* Opposition of Dell/Microsoft at 4.

[9] While Dell/Microsoft criticize Shure for not supplying specific technical details, they provide no interference analysis or technical support for their position, which lacks technical merit. Emissions from a TVBD actually could be significantly higher than the wireless microphone signals being received, when typical body losses for the wireless microphone operation are taken into account. Dell/Microsoft also fail to recognize that the geolocation accuracy required by the FCC for TVBDs is 50 meters, meaning that there may be only a 50-meter separation between the TVBD and the wireless microphone receiver, further exacerbating interference problems. As Shure has observed, the 1 km distance barely is sufficient for personal/portable devices and must be increased to provide protection from higher power fixed operations.

microphone use around the area occupied by large event venues such as stadiums [and] fairgrounds."[10]

Second, there is no basis for the opposition of the Land Mobile Communications Council ("LMCC") to the request of IEEE 802 and the Society of Broadcast Engineers ("SBE") that the Commission establish a minimum bandwidth for TVBD transmissions. The out-of-band emission limit adopted by the Commission was based upon the assumption that only a single interfering signal from a TVBD would be present in a single, 6 MHz-wide channel. If narrowband emissions are allowed, however, there will be multiple interferers within that single channel, resulting in increased out-of-band emissions. Thus, the narrowband operations that LMCC proposes for TVBDs would defeat the Commission's efforts to reduce out-of-band emissions from TVBDs to licensed services.

Third, MSTV and NAB dispute Google's critique of proposals to measure the maximum antenna height of fixed TVBDs according to height above average terrain ("HAAT"). SBE and IEEE 802 have explained that expression of maximum antenna height in terms of height above ground level ("AGL") alone, as supported by Google, would "considerably underestimate the required separation distance and compromise the protection of the TV service in some situations and would unnecessarily limit fixed base station coverage area in other situations."[11] Google's complaint — that use of a HAAT measurement would require "more sophisticated calculations" and thus "imped[e] prompt and cost-effective WSD deployments"[12] — betrays the fact that Google is more interested in keeping TVBD costs low than in helping the

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[10] *Second Report and Order* at ¶ 199.

[11] Petition for Reconsideration of IEEE 802 at ¶ 11.

[12] Opposition and Comments of Google at 14.

Commission to adopt rules that preserve the public's access to licensed services, including free, over-the-air television.

Fourth, the Commission should reject proposals to further expand the spectrum being provided to TVBDs at the expense of primary licensed broadcasting and wireless microphone operations.[13] Shure, in its Opposition, provides an extensive justification for rejecting the proposals of Dell/Microsoft and the Public Interest Spectrum Coalition ("PISC") to permit operation of personal/portable TVBDs below channel 21, and the additional PISC proposal to eliminate the two channels in the channel 21-51 range that the Commission reserved for wireless microphone operation in thirteen markets.

While MSTV and NAB need not reiterate Shure's analysis here, the bottom line is that the rules adopted in the *Second Report & Order* will leave wireless microphones with too little spectrum, not too much. Those rules provide two channels for wireless microphone operations, but only in thirteen markets. While personal/portable TVBDs are not allowed in the VHF band below channel 21, the VHF spectrum is heavily used by television stations and land mobile operations, and at this stage it is not clear that sufficient spectrum remains in that spectrum to support robust wireless microphone operations. In many markets, there truly will be no "safe harbor" for wireless microphone operation.

Particularly incorrect is Google's assertion that the two-channel set-aside in thirteen markets "would permit the simultaneous operation of 60 wireless microphones."[14] In

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[13] PISC seeks authorization for personal/portable devices to operate on channels below 21 (Opposition of PISC at 7) and the elimination of safe-harbor channels above channel 21 (*id.* at 5), while Motorola asks the Commission to remove the restriction on personal/portable devices operating on channels 5-13 (Opposition of Motorola at 3).

[14] *See* Opposition and Comments of Google at 11.

fact, it would take four to six channels to permit simultaneous operation of 60 wireless microphones, such as at a political convention. Google's conclusion appears to ignore the fact that most microphones are FM, and thus need to avoid using adjacent channels and avoid operation at the edge of a channel to prevent interference. Google's assertion that wireless microphones have "enough" spectrum also ignores the need for microphones to vacate channels 52-69 — a total of 108 MHz — to make way for the new commercial and public safety services entering the 700 MHz band. The reality is that scarcity of spectrum for wireless microphones will impede coverage of events such as the Olympics, the Super Bowl, and political conventions, and breaking news and weather emergencies.

II. THE OPPOSITIONS HIGHLIGHT THE IMPORTANCE OF A COMPREHENSIVE, RELEVANT, AND SECURE DATABASE THAT IS CHECKED BY TVBDS FREQUENTLY.

The Commission has established the geolocation/database method as the primary means of ensuring that unlicensed TVBDs are able effectively to determine whether it is safe to transmit on a given channel. MSTV and NAB's Opposition noted three criteria for a viable database: it must be comprehensive (have the right content); timely and relevant (be checked by TVBDs frequently); and reliable and secure (administered appropriately and protected from hacking). Several of the Oppositions highlight the importance of these criteria.

With respect to database content, MSTV and NAB oppose the assertion of Dell/Microsoft that cable headends within a station's service contour do not deserve protection in the database. As DIRECTV points out, protection within the contour is necessary because "TV band devices can potentially interfere with signal reception when they are located very near the local channel receive facility" and "local channel receive facilities located near a station's

protected contour boundary will be at risk of interference."[15] Regarding the frequency of TVBD communication with the database, Google's opposition to frequent checking of the database by TVBDs lacks merit. Google complains that a requirement to check the database more frequently would "shift the burdens of wireless microphone users' inefficient operations, including failure to timely register, to WSD operators."[16] MSTV and NAB disagree, and believe that frequent checks are required to protect licensed services critical to providing coverage of important – but unpredictable – events, such as breaking news, public safety emergencies, and severe weather.

Absent adoption of a requirement to check the database on a real-time basis, there is a particular risk of endangering wireless microphone operations.[17] Consider a venue that registers for the database from noon-to-5 p.m. for a major sporting event. If a TVBD were to check the database at 5 a.m. and commence operations on a given channel, it could still be operating on that channel in the afternoon when wireless microphones at that venue attempt (and fail) to operate.[18] To that end, MSTV and NAB note that the Coalition of Wireless Microphone Users support an hourly check, with a requirement that TVBDs that move significantly (*i.e.*, 50 meters) check the database again within a minute.[19] The Commission should require devices to

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[15] Comments of DIRECTV at 6.

[16] *Id.*

[17] Notably, several Oppositions seek elimination of the spectrum sensing requirement. *See, e.g.*, Opposition and Comments of Google at 6 (arguing for elimination of spectrum sensing requirements for devices with geolocation/database capabilities); Comments of CWT at 4-5. Although others are now beginning to realize that sensing is an unreliable mechanism for detecting and avoiding destructive interference to wireless microphones, the use of sensing would add a layer of protection (albeit not sufficient) that should not be discarded.

[18] Indeed, setting aside breaking news, a 24-hour requirement clearly is deficient with respect to venue protection, such as in cases where venues change at the last minute due to weather and other events. (For example, the final round of the Masters was delayed a day due to rain.)

[19] Opposition of Wireless Microphones at 8.

check in real-time or near real-time. Absent such a requirement, the FCC will have to set aside more channels to accommodate live news operations.

III. THE -114 DBM SENSING LEVEL WILL INTERFERE WITH THE PUBLIC'S RECEPTION OF FREE, OVER-THE-AIR TELEVISION SERVICE.

The record in this proceeding makes clear that the -114 dBm sensing level, particularly without measurement standards, will not protect primary television operations and wireless microphones. Google's assertion that the Commission should relax the sensing threshold to -107 dBm would only exacerbate these harms.[20] The Commission's own data show that a sensing value of -122 dBm would be more appropriate.[21] A more sensitive threshold would not only provide better protection for incumbent, primary digital television service, but would also provide needed a safeguard for wireless microphones.[22] Accordingly, MSTV and NAB support the conclusion of the Coalition of Wireless Microphone Users that the -114 dBm sensing level is inadequate and that a tighter sensing level is needed if the viewing public is to be protected (such as the -126 dBm level proposed in the United Kingdom).[23]

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[20] Opposition and Comments of Google at 12.

[21] *See* Opposition of MSTV and NAB at 17.

[22] *See id.* at 17-18 (citing Commission recognition that the -114 dBm sensing level fails to provide consistent detection of wireless microphone signals).

[23] *See* Opposition of Wireless Microphones at 9-10.

CONCLUSION

As it evaluates Petitions for Reconsideration and Oppositions thereto, MSTV and NAB respectfully request that the Commission be guided by its goal of introducing TVBDs while simultaneously protecting the public's access to licensed services, including free, over-the-air television. To that end, the Commission should deny requests for increases in power and other operating parameters of fixed and personal/portable TVBDs, ensure sufficient access to spectrum for wireless microphones, promote a safe, secure and reliable database of protected services, and refuse to further weaken the threshold at which TVBDs will attempt to "sense" for licensed services.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Kathryn Bowers, a secretary at the law firm of Covington & Burling LLP, do hereby certify that on this 18th day of May, 2009, I caused a copy of the foregoing "Reply of MSTV and NAB to Oppositions" to be sent via first-class U.S. Mail, postage prepaid, to the following:

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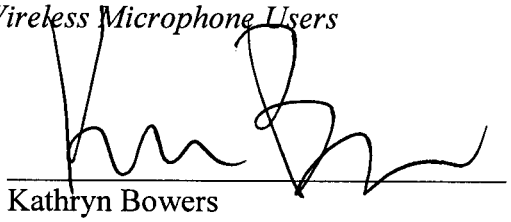

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