

**BEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
Washington D.C. 20554**

In the Matter of	)	
	)	
Revision to Rules Authorizing the Operation of Low Power Auxiliary Stations in the 698-806 MHz Band	)	WT Docket No. 08-166
	)	
Public Interest Spectrum Coalition, Petition for Rulemaking	)	WT Docket No. 08-167
	)	
Unlicensed Operation in the TV Broadcast Bands	)	ET Docket No. 04-186
	)	

**EX PARTE COMMENTS OF SHURE INCORPORATED**

On June 8, 2009, Verizon Wireless (“Verizon”) submitted an *ex parte* letter proposing radical changes to the regulation of wireless microphones in the core television bands that would effectively leave wireless microphones and many users nationwide who rely on wireless microphone technology completely vulnerable to devastating interference.<sup>1</sup> On June 18, 2009, Public Knowledge filed an *ex parte* notice acknowledging that it too urged Acting Chairman Copps and his legal advisors to adopt similar changes.<sup>2</sup> These changes, essentially relegating wireless microphones to Part 15 status, were described as a “workable” plan that provides “certainty, speed and flexibility.”<sup>3</sup> This characterization is completely false and should be rejected.

The purpose of this submission is to voice strong objection to the proposal being urged by Verizon and Public Knowledge that would effectively scrap interference protection for many wireless microphones, and to explain why the proposed rule changes are neither credible nor appropriate solutions

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<sup>1</sup> See Ex Parte Presentation of Verizon Wireless, ET Docket Nos. 04-186 and 02-380; WT Docket Nos. 08-166 and 08-167 (filed Jun. 8, 2009) (“*Verizon Ex Parte*”).

<sup>2</sup> See Ex Parte Presentation of Public Knowledge, ET Docket No. 04-186; WT Docket Nos. 08-166 and 08-167 (filed Jun. 18, 2009) (“*Public Knowledge Ex Parte*”).

<sup>3</sup> *Verizon Ex Parte* at 2-3.

to the significant interference issues threatening wireless microphones in the 700 MHz band and core TV spectrum bands.<sup>4</sup> Adopting these proposals would materially impair the utility of the core TV bands for many wireless microphone users and contradict the Commission’s long-standing mandate to protect incumbent users of “white spaces” spectrum. Further, Shure disagrees that this approach would facilitate clearing the 700 MHz band.<sup>5</sup> Verizon claims that its proposal will benefit wireless microphone users (and others) by providing “speed and certainty.”<sup>6</sup> However, the only certainty that this plan offers wireless microphone operations is the certainty of devastating interference from new TVBDs. This counterproductive proposal is nothing more than a regulatory “Trojan Horse” that will strip many wireless microphones of interference protection in the core TV bands and significantly hinder continued migration of wireless microphone operations out of the 700 MHz band.

**I. “OPERATION BY RULE” SHOULD NOT BE CONVERTED INTO A MEANS TO ELIMINATE INTERFERENCE PROTECTION FOR WIRELESS MICROPHONES**

Verizon/Public Knowledge propose to reclassify wireless microphones as Citizens Band (“CB”) radios operated “by rule” pursuant to Section 307(e) of the Communications Act.<sup>7</sup> Significantly, Verizon also adds on the special -- and unsupportable -- condition that all such wireless microphones should be treated as “co-equal” with Part 15 TVBDs operating in the same frequencies.<sup>8</sup> This plan represents a

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<sup>4</sup> In WT Docket Nos. 08-166 and 08-167, among other things, Shure has urged the Commission to adopt a 2-year transition period for wireless microphones operating in the 700 MHz band and has also explained its many efforts, beginning years ago, to encourage wireless microphone users out of the 700 MHz band. Cite. Shure has also proposed a number of changes to the Commission’s Rules in the Second Report and Order in ET Docket No. 04-186 to implement more fully the intended interference protections for wireless microphones, including requiring reliable spectrum sensing features in all television band devices (“TVBDs”) and revisions to certain operational and technical requirements. *See Petition for Reconsideration of Shure Incorporated*, ET Docket No. 04-186 (Mar. 18, 2009) (“*Shure Petition*”).

<sup>5</sup> *See, e.g., Verizon Ex Parte* at 1. “The purpose of this letter is to discuss two alternatives for clearing [broadcast auxiliary] devices from the 700 MHz band quickly.”

<sup>6</sup> *Verizon Ex Parte* at 2.

<sup>7</sup> Telecommunications Act of 1996, Pub. L. No. 104-104, § 307(e), 110 Stat. 56, 145-146 approved Feb. 8, 1996.

<sup>8</sup> *See Verizon Ex Parte* at 3-4.

radical and irreconcilable departure from Commission precedent and, if adopted, would result in great harm to wireless microphone operations nationwide.

The requested regulatory reclassification of wireless microphones paints an inaccurate and incomplete picture of the Commission's implementation of Section 307(e) and the Commission's Part 95 rules and precedent by which that statutory provision has been implemented. No past Commission action authorizing *en masse* transmitter operation "by rule" is analogous to Verizon's proposal. Section 307(e) was created for the express purpose of enabling the Commission to permit certain higher power radio operations to continue without individual licensing (which would be administratively burdensome to both users and the Commission) but while maintaining priority for the purpose of interference protection.<sup>9</sup>

Prior Commission decisions implementing Section 307(e)/Part 95 "by rule" operations carefully evaluated the proposed transmitters and anticipated use models, as well as the spectrum needs of other users in the relevant radiofrequency bands, to ensure that co-channel interference would not prohibit or diminish the utility of the proposed "by rule" operations.<sup>10</sup> In fact, providing interference protection for proposed Part 95 operations "by rule" has been stated as a "primary goal" of the Commission.<sup>11</sup> This thoughtful approach has resulted in Part 95 "by rule" operations being authorized largely in lightly used swathes of spectrum where co-channel interference is unlikely, and when interference does occur, the likely source is another "by rule" transmitter whose operations can be predicted and readily avoided by

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<sup>9</sup> See, e.g., *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, Second Report and Order and Second Memorandum Opinion and Order, 19 FCC Rcd 24558, 24594 (Dec. 16, 2004) ("*UWB 2nd R&O*") ("Under the licensing exemptions of Section 307(e), certain higher power communications services may be provided without any Commission review of the provider or of the specific operation that the provider intends to provide. Rather, the Commission adopts a set of rules that prescribe parameters of operation, and anyone may operate the service in any manner [consistent with] those parameters.")

<sup>10</sup> See, e.g., *Amendment of Part 95 of the Commission's Rules to Establish a Very Short Distance Two-Way Radio Service*, Report and Order, 11 FCC Rcd 12977, 12982 ("*FRS R&O*") ("Our primary objectives in setting [Part 95 Family Radio Service ("*FRS*") standards are to ensure (1) that FRS units do not cause interference to other services and (2) that large numbers of [FRS] users can share the same channels in the same or adjoining neighborhoods or other areas.")

<sup>11</sup> See, e.g., *Amendment of Parts 2 and 95 of the Commission's Rules to Create a Wireless Medical Telemetry Service*, Notice of Proposed Rulemaking, 14 FCC Rcd 16719, ¶ 41 (1999) ("*WMTS NPRM*") ("[O]ur primary goal in this proceeding is to protect the operation of [Part 95] equipment from harmful interference.").

the affected transmitter.<sup>12</sup> The Commission has also elevated Part 95 operations to co-primary status in bands where additional interference protection was required.<sup>13</sup> Contrary to what has been suggested, in all cases in which the Commission has turned to operation “by rule,” the Commission sought to relieve the inordinate administrative burdens of individual licensing, but did not envision operation “by rule” as a means of reducing the protection from interference from other devices or services.

## **II. “CO-EQUAL OPERATION BETWEEN PART 74 MICROPHONES AND PART 15 TVBDS IS UNWORKABLE**

Basic engineering principles that the proponents ignore make “co-equal” operation of Part 74 wireless microphones and Part 15 TVBDS impossible in the core television bands without incorporating comprehensive interference protections for wireless microphones. The Commission has previously authorized “co-equal” operation over shared spectrum when co-channel interference can be sufficiently mitigated to prevent disruption or degradation of either service by physically separating transmitters so that signal strength is attenuated to the point where it does not create harmful interference to a “co-equal” user of the spectrum.<sup>14</sup> Alternatively, “co-equal” operations have been authorized when transmissions can be coordinated to prevent co-channel interference, largely through the use of directional antennas.<sup>15</sup> The safeguards described above would not exist in the core television bands under a “co-equal” framework.

“Co-equal status” on the surface seems to describe a fair and balanced coexistence; both TVBD users and wireless microphone users would have to accept interference from each other and negotiate, if

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<sup>12</sup> For example, in the coterminous U.S. Family Radio Service transmitters operate co-channel with a significantly smaller number of licensed radios, but otherwise have exclusive use of dedicated UHF channels.

<sup>13</sup> See, e.g., *Amendment of Parts 2 and 95 of the Commission’s Rules to Create a Wireless Medical Telemetry Service*, Notice of Proposed Rulemaking, Report and Order, 15 FCC Rcd 11206, 11206 (2000). (“The Commission allocates 14 Megahertz (MHz) to WMTS on a primary basis, which will allow [Part 95 equipment] to operate on an interference-protected basis. The Commission also adopts service rules for WMTS that “license by rule” to minimize regulatory procedures to facilitate rapid deployment”).

<sup>14</sup> For example, certain Ku-band satellite transmissions are prohibited from operating in a radius that varies from 45 to 125 kilometers from radioastronomy facilities in Guam, White Sands, Arecibo, Mauna Kea and St. Croix. See 47 C.F.R. § 25.222.

<sup>15</sup> For example, Part 101 terrestrial microwave and Part 25 satellite ground stations share the C-band on a co-equal basis and are required to coordinate operations. See 47 C.F.R. § 25.115.

possible, resolutions to such interference. In reality, however, it will be wireless microphone users, not TVBD users, that will suffer devastating interference thereby destroying the essential utility of their transmissions. Wireless microphone users cannot tolerate interference. Unlike consumers using wireless laptops, PDAs, cordless phones or other potential TVBDs, wireless microphone users -- and their many audiences --- require crystal clear quality and real-time transmission. In Verizon's "co-equal" scheme there is absolutely no incentive and no practical means for TVBD users to restrict their output or reposition transmitters to avoid potentially affected wireless microphone operations.<sup>16</sup> There is no proposal to coordinate or physically separate "co-equal" TVBDs and wireless microphone operations. While it may be possible for a TVBD user to pinpoint potential interference arising from a wireless microphone operating in a nearby music performance, church or business conference where microphones are used, the reverse is not true as wireless microphone users will not be able to identify the interfering TVBD user in a crowd, across the street from a church, or in a business conference. Moreover, the relative actual power levels of TVBD and wireless microphone operations impose significant disadvantages on wireless microphones. Wireless microphone users typically operate at power levels well below those allowed for TVBD users,<sup>17</sup> during inevitable incidents of co-channel interference, the outcome would almost always favor the more powerful TVBD.<sup>18</sup>

It is also noteworthy that the enormous disparity between the projected volume of TVBDs and wireless microphones makes "co-equal" status in the core television bands wholly impractical. TVBD proponents have repeatedly stated that they expect to introduce millions of consumer transmitters into the

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<sup>16</sup> It should not escape attention that Public Knowledge, as well as commercial manufacturers and certain other parties, are busy lobbying the Commission to do away with technical and operational wireless microphone protections in the Commission's "White Spaces" order. See *Petition for Reconsideration of the Public Interest Spectrum Coalition ("PISC")*, ET Docket No 04-186 (Mar. 19, 2009) (Public Knowledge is a founding member of the unincorporated *ad hoc* coalition PISC).

<sup>17</sup> To achieve significant frequency reuse and conserve battery life, most microphones operate with 10 - 50 mW of output; however, user body absorption reduces the typical microphone's output to less than 10 mW. See *Ex Parte Comments of Shure Incorporated*, ET Docket No. 04-186 (filed Sep. 17, 2007).

<sup>18</sup> The interference radius of a 100 mW personal/portable TVBD transmitter into a typical Part 74 microphone receiver extends 2.4 km. See *Shure Ex Parte Presentation*, ET Docket No. 04-186, 11-17 (filed Jun. 13, 2007).

marketplace.<sup>19</sup> Ultimately, Verizon's proposed "co-equal" framework would ensure that TVBDs flourish while simultaneously transforming the TV bands into an uninhabitable environment for the many microphone users. In such an environment, where an aggressively deployed user overwhelms a spectrum band and consumes a disproportionate amount of available spectrum, the Commission has determined that "co-equal" status is not appropriate.<sup>20</sup>

### **III. RETROACTIVE RECLASSIFICATION OF WIRELESS MICROPHONES AS PART 15 DEVICES IS CONTRARY TO PRECEDENT AND THE PUBLIC INTEREST**

Retroactively authorizing sensitive wireless microphones as Part 15 devices subject to interference from potentially millions of Part 15 TVBDs would irreparably harm high-fidelity, professional quality microphone operations. It is a basic tenet of Part 15 status that Part 15 devices must accept interference from licensed services, other Part 15 devices and Industrial, Scientific and Medical devices.<sup>21</sup> Further, Part 15 users have "no vested or recognizable right to continued use of any given frequency."<sup>22</sup> While the core television bands are already heavily occupied with broadcasters and wireless microphones used in live music performances, business gatherings, educational institutions and houses of worship, TVBD manufacturers and proponents -- including some of the world's largest electronics manufacturers -- are preparing to introduce Part 15 TVBDs *en masse* into these bands.<sup>23</sup> Based on the Commission's November 4, 2008, ruling, TVBDs are projected to operate with effective

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<sup>19</sup> For example, TVBD proponents have stated their intent for unlicensed devices to populate the core TV bands "just like tens of millions of WiFi devices - and hundreds of millions of cordless phones, baby monitors and other devices that share..... unlicensed spectrum today." New America Foundation, Policy Brief: The Feasibility of Unlicensed Broadband Devices to Operate on TV Band "White Space" Without Causing Harmful Interference (Sep. 2007), <http://www.newamerica.net/files/WhiteSpaceDevicesBackgrounder.pdf>.

<sup>20</sup> See *Creation of a Low Power Radio Service*, Second Order on Reconsideration and Further Notice of Proposed Rulemaking, 20 FCC Rcd 6763 (2005).

<sup>21</sup> See 47 C.F.R. § 15.5.

<sup>22</sup> *Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 12 FCC Rcd 13942, 13957 (1997).

<sup>23</sup> For example, Dell has already confirmed it will embed TVBD transmitters in laptop computers. See Statement of Dell Director of Technology, Neeraj Srivastava (Nov. 5, 2008), [http://www.pcworld.com/businesscenter/article/153388/dell\\_to\\_offer\\_white\\_space\\_connectivity\\_in\\_laptops.html](http://www.pcworld.com/businesscenter/article/153388/dell_to_offer_white_space_connectivity_in_laptops.html).

radiated output that vastly exceeds the average wireless microphone. Moreover, these devices will operate without a duty cycle limitation and many will have use models that involve transmission at maximum power over extended periods of time.<sup>24</sup> Declaring wireless microphones Part 15 devices or “co-equal” with Part 15 devices in this type of environment would severely harm wireless microphone operations in the core TV bands due to frequent, unavoidable and unpredictable co-channel interference.

All Part 15 devices “operate on a sufferance basis”<sup>25</sup> and Part 15 principles and rules were never intended to accommodate uses where service quality and reliability are essential features. As the Commission has stated, Part 15 provides a framework largely for consumer devices that tolerate interference without a noticeable degradation in performance.<sup>26</sup> Wireless microphone users -- *and their many audiences* -- require a high quality of service and reliability free from interference. Any disruptions or interference in a wireless microphone user’s transmission is considered disastrous for the performance, due to the live and real-time nature of professional audio production.

Verizon and Public Knowledge cite no precedent for retroactively reclassifying wireless microphones as Part 15 devices because there is none. This is a regulatory “sleight of hand” that, if adopted, will result in significant and unprecedented changes to the regulation of wireless microphones.

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<sup>24</sup> The Commission has previously expressed concern that unlicensed devices without a duty cycle limitation - including Wireless Internet Service Provider access points similar to those proposed by Motorola and others for the core TV bands -- may occupy and preclude other users from accessing spectrum. *See Modification of Parts 2 and 15 of the Commission Rules for Unlicensed Devices and Equipment Approval*, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 11383, 11390 (2007).

<sup>25</sup> *Amendment of Part 15 of the Commission’s Rules to Permit Operation of Biomedical Telemetry Devices on VHF TV Channels 7-13 and on UHF Channels 14-46*, Report and Order, 12 FCC 17828, 17840 (1997); *see also* 47 C.F.R. § 15.5.

<sup>26</sup> *See Continental Airlines Petition for Declaratory Ruling Regarding the Over-the-Air Reception Devices (OTARD) Rules*, Memorandum, Opinion and Order, 21 FCC 13201, 13214 (2006) (Noting that Wi-Fi and consumer applications were appropriate under Part 15, but that “[u]sers who believe they must have interference-free communication should pursue exclusive-use options. . . . instead of relying on Part 15 devices.”); *see also Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License*, First Report and Order, 4 FCC Rcd. 3493, 3502 (1989) (Authorizing Part 15 operations in the RF bands that currently support Wi-Fi and other consumer applications the Commission noted that “many Part 15 applications [] are tolerant of interference,” and refused to “restrict use of [the 915 MHz, 2.4 GHz and 5.8 GHz] bands by Part 15 equipment because of the possibility of interference to that equipment by equipment operating under other rule parts.”).

In addition, further suggestions from TVBD proponents to reduce or eliminate the comprehensive interference protections that the Commission carefully crafted for wireless (e.g., mandatory TVBD spectrum sensing and access to database protections) would render the TV bands useless for wireless microphone operations, with devastating effects on the production of news, sports, entertainment, religious services, governmental assembly, business meetings and special events, among many other culturally important activities.

#### **IV THE RECORD IN THESE PROCEEDINGS DOES NOT SUPPORT A RADICAL FCC RULE CHANGE FOR PART 74 MICROPHONES**

Even if the proposals of Verizon and Public Knowledge were supported by Commission precedent and basic engineering principles, which they are not, the FCC has not provided the notice or opportunity for comment required by the Administrative Procedures Act. In fact, these late suggestions are contrary to principles that the Commission laid out from the very beginning of the “white spaces” proceeding when it clearly declared that the hierarchy of radio operations in the core TV bands regulations would remain intact.<sup>27</sup> The Commission has not waived from this important principle and should not now.<sup>28</sup> Demoting wireless microphones to “co-equal” status with Part 15 TVBDs fundamentally conflicts with the Commission’s long-standing mandate to protect all incumbent operators -- including wireless microphones -- in the core TV bands from interference created by new entrants.<sup>29</sup> New proposals to revise the regulation of wireless microphones in the core TV bands would be

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<sup>27</sup> See *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Notice of Proposed Rulemaking, ET Docket Nos. 04-186, FCC 04-113, at ¶ 6 (2004) (“*NPRM*”).

<sup>28</sup> See *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, Second Report and Order and Memorandum Opinion and Order, 23 FCC Rcd 16807, 16809 (2008) (“*2nd R&O*”).

<sup>29</sup> See *NPRM* at 2.

unexpected, and not “consistent with the issues and questions posed in the notice[s]” in the underlying proceedings.<sup>30</sup>

Respectfully submitted,

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<sup>30</sup> See 2002 Biennial Regulatory Review - Review of the Commission's Broadcast Ownership Rules and Other Rules, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 13620 (2003) ("*Ownership Order*"), aff'd in part and remanded in part, *Prometheus Radio Project, et al. v. FCC*, 373 F3d 372 (3d Cir 2004) ("*Prometheus Remand Order*"), cert. denied, 125 S Ct 2902, 2903, 2904 (2005).