

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

In the Matters 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

**PETITION FOR RECONSIDERATION
OF DELL, INC. AND MICROSOFT CORP.**

The Federal Communications Commission’s (“FCC” or “Commission”) decision to free unused television spectrum for unlicensed broadband is a great victory for American consumers. By any measure, the white spaces proceeding was among the most extensive and rigorous rulemakings ever conducted by the FCC. The Commission should be proud of both its decision and its decision making process, which made the proceeding’s evaluation methodology, data collection, and experimental design fully available to the public.

Dell and Microsoft petition the Commission for reconsideration, however, because the level of protection afforded certain incumbent operations by the Order goes beyond what the public interest requires. Dell and Microsoft share the views expressed by Chairman Copps and Commissioners Adelstein and McDowell that the decision to allow personal/portable white spaces devices will “reap huge benefits for the American

people,”¹ create the “opportunity for an explosion of entrepreneurial brilliance,”² and even provide “the blank pages on which we will write our broadband future.”³ To achieve this vision fully, however, the Commission should first make minor but important rule adjustments in three areas to allow consumers to use white space devices with only those operating parameters necessary to protect incumbent operations.

I. TV BAND DEVICES USING GEOLOCATION TECHNOLOGY DO NOT ALSO REQUIRE STRINGENT WIRELESS MICROPHONE SENSING REQUIREMENTS.

The White Spaces Order requires TV band devices (“TVBDs”) to protect wireless microphones and other low power auxiliary services by (1) avoiding a large set of restricted channels; (2) determining each device’s geographic location; (3) querying a database to determine a list of permissible and impermissible (occupied) channels in that geographic location prior to operation; and (4) “sensing” the presence of incumbent low power operations.⁴ Requiring so many overlapping interference avoidance technologies for wireless microphones will make each consumer pay more for white spaces devices, such as laptops, and reduce spectrum efficiency. The Commission can more than adequately protect wireless microphones, while imposing far less cost and allowing more consumer utility, by altering the spectrum sensing requirements. The record demonstrates that these spectrum sensing requirements may have been necessary if they served as the only mechanism for avoiding interference to wireless microphones – but

¹ *Unlicensed Operations in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and the 3 GHz Band*, 23 FCC Rcd. 16807, 16927 (2008) (Statement of Commissioner Copps) (“*Second R&O*”).

² *Id.* at 16931 (Statement of Commissioner McDowell).

³ *Id.* at 16929 (Statement of Commissioner Adelstein).

⁴ *See generally id.*

these extremely strict requirements are not necessary in light of the Commission’s decision to also impose geolocation capability, database querying, and channel set asides.

The Commission concluded that “wireless microphones can be adequately protected under an approach that provides for registration of sites and times where microphones are operated,” but nonetheless has required spectrum sensing as a “back-up” to this registration/database system.⁵ Dell and Microsoft believe that a combination of geolocation, database querying, and sensing technologies is unnecessary to protect incumbent licensees. Indeed, the Wi-Fi Alliance already has asked the Commission to remove the microphone sensing requirement for geolocation-enabled TVBDs entirely,⁶ and Dell and Microsoft agree that sensing is unnecessary for geolocation-enabled devices. But if the Commission finds that it must impose both requirements, it can do so in a manner that will prove less of an obstacle to introducing valuable new applications by reducing the sensing threshold to reflect the added protection provided by geolocation and database querying.

The extremely conservative -114 dBm detection threshold for wireless microphone systems was proposed by a number of technology companies – including Dell and Microsoft – assuming that sensing would be the only method of protecting incumbents.⁷ In contrast, proposals in the record contemplating more than one means of protecting incumbents recommended a less stringent sensing requirement. For example,

⁵ *Id.*, ¶ 198.

⁶ *See* Wi-Fi Alliance, Petition for Reconsideration at 4-5 (filed Mar. 17, 2009).

⁷ *See* Reply Comments of Dell Inc., Google, Inc., the Hewlett-Packard Co., Intel Corp., Microsoft Corp., and Philips Electronics North America Corp. at 28-29 (filed Mar. 2, 2007).

IEEE 802.18 determined that -107 dBm was an appropriate sensing level even for fixed devices operating at 4 Watts EIRP, which have 40 times the maximum power permitted for the personal/portable devices at issue here.⁸ In fact, even wireless microphone manufacturer Shure, Inc. assumed a -107 dBm threshold in its initial comments when describing the spectrum sensing component of its multi-part “interference mitigation solution.”⁹

Adopting a -114 dBm sensing threshold for wireless microphones and other low power broadcast auxiliary stations in addition to geolocation/database and channel-reservation protections could reduce white space utility in important ways. This is the case because, first, engineering a device to avoid significant false positives at the extremely low sensing threshold of -114 dBm for wireless microphones would require significant time and expense, thereby increasing the cost of white spaces devices to consumers. In addition, spectrum sensing does not distinguish between licensed operations entitled to protection and systems that operate illegally, such as illegal wireless microphones, negating one of the primary benefits of the geolocation/database approach and unnecessarily restricting spectrum access for legal users.

To mitigate these issues, Dell and Microsoft propose that if the Commission wishes to “back up” its geolocation and channel set-aside protections with spectrum sensing for wireless microphones, it do so by requiring a detection threshold of -107 dBm as recommended by IEEE 802.18 and others. Moreover, while this detection level may be appropriate for higher power fixed/access devices, personal/portable devices that

⁸ See Comments of IEEE 802.18 at 9-10 (filed Jan. 31, 2007).

⁹ Comments of Shure Incorporated at 33 (filed Nov. 30, 2004).

transmit only at levels up to 100 mW are far less likely to cause harmful interference, and should operate using a less stringent detection threshold. Specifically, the Commission should implement a dB-for-dB compensation for lower-power white space operations, increasing the level at which wireless microphones would need to be sensed commensurate with the decrease in power of the TVBD transmission. Adopting this approach would allow industry to bring white space devices to consumers more quickly and enable consumers to use their devices more effectively.

II. THE COMMISSION SHOULD PROVIDE GREATER FLEXIBILITY FOR TV BAND DEVICES TO ACCESS VACANT SPECTRUM.

A. Restricting Personal/Portable Device Operation Below TV Channel 21 is Not Necessary.

Because fixed TVBDs transmit at higher power levels than personal/portable devices, the Commission imposed additional restrictions on these devices. These restrictions included prohibiting operations on channels immediately adjacent to occupied television channels and registration with the white spaces database system.¹⁰ But while fixed devices are allowed to operate below channel 21 (including channels 14-20 outside of the thirteen markets where some of those channels are allocated for licensed public safety and other mobile operations), the Commission has excluded all personal/portable devices from those same channels regardless of the interference-avoidance technologies used.¹¹ This restriction creates an anomaly in the white spaces rules. Higher power white space devices using geolocation have unfettered access to vacant spectrum below channel 21 throughout most of the country. But devices using identical interference-

¹⁰ See *Second R&O*, ¶¶ 109, 170.

¹¹ *Id.*, ¶ 148.

avoidance technology and operating at much lower power are categorically excluded from those same channels.

Several technology companies initially supported the exclusion of personal/portable devices from channels 14-20, including Dell and Microsoft. But as with microphone sensing requirements, they did so under the assumption that spectrum sensing would be the only incumbent protection mechanism. Now that the Commission has imposed rigorous geolocation and database querying requirements for a class of personal/portable devices, restricting all personal/portable devices to spectrum above channel 20 is not necessary. For example, Dell and Microsoft continue to believe that sensing-only TVBDs should be excluded from channels 14-20 in all markets to avoid interference to mobile operations in certain cities, since sensing-only devices would have no way of knowing whether they were operating in Pittsburgh (where there are mobile services in channels 14-20) or in Seattle (where there are not). However, personal/portable devices relying on geolocation know exactly where they are. And just like fixed devices, they require an affirmative “okay” from the database to indicate vacant channels at their location prior to transmitting.¹² Accordingly, the Commission should specify that the restrictions on operations below channel 21 apply only to TVBDs relying solely on spectrum sensing, and that all TVBDs that use geolocation/database technology to avoid interference should have the same access to these channels in areas where they are vacant.

¹² Similarly, while some might argue that channels 14-20 should serve as a de facto “safe harbor” for wireless microphone licensees against the risk of interference from sensing-only devices, these same wireless microphone operators can simply report their location to the white spaces database, removing the ability of all geolocation-enabled white space devices to transmit at those locations.

B. The Order’s Cable Headend Restrictions Could Be Misinterpreted to Unnecessarily Restrict Consumer Device Operation.

The Commission also restricted TVBD operations to accommodate cable television headends located outside television service contours.¹³ Specifically, the Commission’s rules contemplate protection for cable headends located up to 80 km away from a service contour, and contain additional restrictions on co-channel and adjacent channel operations near these facilities.¹⁴ Essentially, if a cable headend is located outside a television service contour, the Commission would “stretch” the protection zone from the service contour to the out-of-contour headend.¹⁵ In some cases, this could restrict spectrum access in huge areas roughly the size of the state of Rhode Island, in multiple locations across the country. Given that there are over 7,800 cable systems in the United States¹⁶ – each potentially with its own headend – the Commission should clarify the circumstances under which these facilities would be entitled to protection and reduce or eliminate these “exclusion zones” where practicable.

As a threshold matter, the Order assumes that cable headends should be protected in certain circumstances because they receive signals “*off-the-air*.”¹⁷ The rules, however, note only that the “channel number of each television channel received” by the headend

¹³ *Second R&O*, ¶ 186-87.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ See NCTA, Number of Cable Systems (2008), <http://www.ncta.com/Stats/CableSystems.aspx>.

¹⁷ *Second R&O*, ¶ 182 (emphasis added).

will be entered into the TV bands database.¹⁸ Channels received other than over-the-air indisputably do not need protection from TVBDs. Because television signals routinely are received by headends in numerous ways in addition to over-the-air transmissions – including via fiber optic cable, microwave towers, satellites, and return channels on the cable system itself – the Commission should clarify that headends are entitled to register channels in the database only in instances where the headend is actually relying on an over-the-air signal rather than one of these other signal delivery methods.

In addition, the Commission should clarify that channel registration in the TV bands database by cable headends is limited to *local* channels, not out-of-market distant signals. When NCTA requested protection for headends in this proceeding, it sought to justify its request by stressing that cable systems were obligated to carry certain channels under the Commission’s “must carry” rules even when the cable system headend is located outside of the channel’s service contour.¹⁹ However, cable operators are under no obligation whatsoever to carry out-of-market distant signals in a local market.²⁰ While they may choose to do so, there is no reason this choice should restrict the public use of white space devices in large swaths of the country – particularly when cable companies could make the more efficient decision of obtaining these signals through widely available signal delivery mechanisms that do not deny the public access to spectrum.

¹⁸ 47 C.F.R. § 15.713(h)(6)(iii); *see also* 47 C.F.R. § 15.712(b) (describing calculation of restricted area from “the TV station being received”).

¹⁹ Comments of the National Cable and Telecommunications Association at 16 (filed Jan. 31, 2007).

²⁰ *See* 47 C.F.R. § 76.56(b) (requiring carriage of local commercial television stations); 47 C.F.R. § 76.55(c) (generally defining “local commercial television station” as “within the same television market . . . as the cable system”); 47 C.F.R. § 76.55(e) (generally defining “[t]elevision market” as a Designated Market Area).

Because information regarding the location of cable headends is not publicly available, it is difficult to assess the potential impact of allowing headends to register out-of-market signals in the TV bands database. But as NCTA recently explained to Congress, “[n]early sixty percent of the more than 1700 broadcast stations are being carried as distant signals and cable subscribers, on average, continue to receive *at least* two distant signals as part of their basic service.”²¹ While large exclusion zones in rural areas for headends that receive local stations may still leave sufficient unoccupied spectrum for white space applications, it is far less clear that this would be the case if white space devices would be required to protect both local *and* out-of-market signals well outside of their service contours.

In light of the multiple options available to deliver signals to cable headends, the Commission should make clear that the small risk that cable providers will need to arrange for an alternative signal delivery method (such as microwave links or fiber) as part of their private carriage agreements with out-of-market broadcasters does not outweigh the certainty that this spectrum will be foreclosed to innovative broadband applications by explicitly limiting channel registration by headends to local channels.

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Dell and Microsoft applaud the Commission’s order establishing final rules for white space operations, and share the Commission’s optimism that enabling access to vacant television band spectrum will enable a wide range of innovative broadband applications and services. By taking the actions set forth above, the Commission will

²¹ Testimony of Kyle McSlarrow, *Copyright Licensing in a Digital Age: Competition, Compensation and the Need to Update the Cable and Satellite TV Licenses* (Feb. 25, 2009), <http://www.ncta.com/DocumentBinary.aspx?id=791> (emphasis added).

ensure that industry can begin bringing the benefits of white spaces to the American public in the near future.

Respectfully submitted,



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