

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of )  
 )  
Modification of Parts 2 and 15 of the ) ET Docket No. 03-201  
Commission’s Rules for unlicensed devices )  
and equipment approval. )

**REPLY COMMENTS OF MOTOROLA, INC.**

Motorola, Inc. (“Motorola”) respectfully replies to the comments submitted in response to the Further Notice of Proposed Rulemaking in the above-captioned proceeding seeking comment on the imposition of spectrum etiquette requirements for unlicensed transmitters authorized under Sections 15.247 and 15.249 of the FCC Rules.<sup>1</sup> As further discussed below, the record in this proceeding demonstrates that adopting any spectrum etiquette for the 902-928 MHz, 2.4 GHz and 5.8 GHz unlicensed bands is contrary to the public interest.

Over 35 comments were filed in response to the Further Notice with the majority agreeing with Motorola to oppose the adoption of any spectrum etiquette.<sup>2</sup> Like Motorola, these commenters recognize the negative impact that imposition of an etiquette

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<sup>1</sup> Modification of Parts 2 and 15 of the Commission’s Rules for unlicensed devices and equipment approval, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 11383 (June 22, 2007) (“Further Notice”).

<sup>2</sup> See Comments of Blaze Broadband; Comments of Bluetooth SIG; Comments of Cisco Systems, Inc.; Comments of Consumer Electronics Association; Comments of Harris Stratex Networks, Inc.; Comments of IEEE 802.18; Comments of Kansas Broadband Internet; Comments of Lectrosonics, Inc.; Comments of Motorola, Inc.; Comments of Polycom, Inc.; Comments of S5 Wireless, Inc.; Comments of Shure Incorporated; Comments of SmarterBroadband; Comments of Telecommunications Industry Association; Comments of TriSquare Communications; and Comments of Wireless Communications Association International, Inc.

would have on manufacturers to provide a wide array of technologies and services in the unlicensed bands, including competitive broadband services, wireless voice devices, cordless telephone systems, baby monitors, direct wireless voice devices, equipment used for law enforcement, and RFID.<sup>3</sup> Moreover, while these comments make clear that the imposition of duty cycle and power limits as proposed by Cellnet would be incompatible with many types of innovative devices that have been developed and deployed using unlicensed spectrum, they are equally clear that the adoption of any spectrum etiquette would disrupt product availability and stifle innovation.<sup>4</sup>

No commenter disputes that the current rules for the unlicensed band have been overwhelmingly successful for spurring innovation and the deployment of a wide variety of technologies, devices and services. One such development is the ability to use the 902-928 MHz band to provide cost effective broadband service to rural America. The provision of such services has been a focus for the Commission for many years and remains a vitally important goal for the country.<sup>5</sup> The 902-928 MHz band has favorable propagation characteristics and allows cost effective broadband services using equipment that can be deployed quickly and easily by smaller entities to provide competitive

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<sup>3</sup> See, e.g., Comments of Polycom, Inc., (in-building and campus wireless telephone systems); Comments of Shure Incorporated, (audio equipment); Comments of Motorola, Inc., (MOTOtalk); and Comments of TriSquare Communications, (handheld radios with push-to-talk; audio and control for in-vehicle video recorders used by law enforcement agencies).

<sup>4</sup> See, e.g., Comments of Cisco Systems, Inc. at 8; Comments of Consumer Electronics Association at 4; Comments of IEEE 802.18 at 9-10.

<sup>5</sup> See Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, Order, 14 FCC Rcd 2398 (1999).

services to rural areas. Serving these important but underserved rural customers is one of the most beneficial uses of the 902-928 MHz band.

In addition to rural broadband service, the comments demonstrate that a rich diversity of devices peacefully coexist in the band. For example, the band is home to cordless telephones, video transmitters, wireless speaker and headphone systems, and wireless local area networking equipment.<sup>6</sup> Manufactures of these devices share Motorola's concerns about the harm that imposition of an etiquette will have on use of the band and the delivery of services that benefit the American public.

Some commenters oppose adoption of the specific etiquette proposed by Cellnet but support the consideration of other forms of etiquette.<sup>7</sup> Not surprising, however, there is no consensus among these commenters as to what form an appropriate etiquette should take.<sup>8</sup> For example, some commenters support a listen-before-talk etiquette, while other

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<sup>6</sup> See *e.g.*, Comments of Consumer Electronics Association, at 1; Comments of Lectrosomics, Inc. at 1; Comments of Shure Incorporated at 1; Comments of Polycom, Inc. at 2.

<sup>7</sup> See Comments of EPCglobal Inc.; Comments of Exalt Communications, Inc.; Comments of Global Information Services, LLC; Comments of Medical Device Manufacturing Association; Comments of Proxim Wireless Corporation; Comments of Software Defined Radio Forum; Comments of The ZigBee Alliance; Comments of Ubisense Ltd; Comments of Vocollect, Inc. and Vocollect Healthcare Systems; Comments of WISPA; Comments of Vecima Networks, Inc.

<sup>8</sup> See, *e.g.*, Comments of EPCglobal Inc. (opposes duty cycle restrictions in the ISM band, opposes listen before talk, and believes the European Union's spectrum etiquette rules have been effective); Comments of Exalt Communications, Inc. (suggests listen before talk monitoring or other requirements that enable better sharing of the spectrum involving duty cycle, output power, and bandwidth); Comments of Global Information Services, LLC, (believes listen-before-talk, limits on duty cycle and power reduction rules would not be effective and that in addition the Commission restrict the utility of some higher power systems); Comments of Proxim Wireless Corporation, (opposes Cellnet but proposes supports listen before talk and proposed 20 ms as the maximum continuous transmission time); Comments of Software Defined Radio Forum,

comments argue that listen-before-talk is not appropriate or will not work with the technology that they have developed.<sup>9</sup> In Motorola's view, this inconsistency and lack of agreement illustrates the major problem in adopting any etiquette in existing bands where robust product development and deployment has already occurred: no single etiquette will be adaptable by all existing services and technologies. If it chooses to impose spectrum etiquettes in the existing unlicensed bands, the Commission will be forced to discriminate against some technologies in order to benefit others. Motorola believes that this would be counter productive and set a dangerous precedent in the regulation of unlicensed spectrum. The widespread deployment of the variety of devices in the unlicensed spectrum is a testament to the success of the band and the innovation that the Commission's policies have spurred. Commission imposition of an etiquette at this time would not only roll back the clock on innovation, but could undermine the confidence in a stable regulatory environment that manufacturers and users rely on as they make the decision to invest in development of the unlicensed bands.

A few commenters support the duty cycle and power restriction etiquette as proposed by Cellnet. For the most part, these commenters are users of Cellnet's products, notably petroleum companies, utilities and railroads, as well as manufacturers

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(suggests the Commission establish performance criteria for etiquette rather than the etiquette rules themselves).

<sup>9</sup> Compare Comments of Exalt Communications, Inc., (suggesting etiquette could be comprised of listen before talk monitoring), and Comments of Proxim Wireless Corporation, (same), with Comments of EPCglobal Inc., (opposing listen before talk), and Comments of Global Information Services, LLC, (Oct. 17, 2007) (same), and Comments of Medical Device Manufacturing Association, (same).

that have designed products similar to Cellnet's.<sup>10</sup> While the services provided by utilities, petroleum companies and railroads ("critical industry") are certainly critical, other industries using the spectrum also provide critical communication services to users and it would not be appropriate for the Commission to eliminate the wide diversity of important uses that have flourished in the band in favor of a single use or technology.

In addition, the extent to which the critical industry entities have or will experience actual interference is unclear. PECO, for example, notes that there have been relatively few instances of interference, but that the company is concerned about the potential for future interference.<sup>11</sup> We Energies also notes that while it did experience interference from a WISP, it was able to work cooperatively with the WISP to resolve the issue and allow for co-existence.<sup>12</sup> The active use of spectrum management, including alternate frequencies or directional antennas for a deployed system, has been a long standing first step to resolving issues when they arise.

Motorola is sensitive to the needs of utilities, petroleum companies and railroads. Unfortunately, imposing an etiquette at this time in a band that supports so many innovative and differing uses of the spectrum would be counterproductive. The strict etiquette proposed by Cellnet would threaten innovation and development in the unlicensed band. Motorola notes that Cellnet did not argue that other solutions are

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<sup>10</sup> See Comments of the American Petroleum Institute and the Utilities Telecom Counsel; Comments of Association of American Railroads; Comments of Cellnet Technology, Inc. and Hunt Technologies, LLC; Comments of GE MDS LLC, FreeWave Technologies, Inc., Dataradio, Inc.; Comments of Itron, Inc.; Comments of PECO Energy Company; Comments of We Energies.

<sup>11</sup> Comments of PECO Energy Company at 2.

<sup>12</sup> Comments of We Energies at 2-3.

unavailable. Solutions that allow the technologies to coexist are available and include, among others, transmit power control, antenna directivity and synchronization between similar systems.<sup>13</sup> Instead of pursuing alternate solutions and approaches, Cellnet would allow the threat of potential harm due to increased band congestion sometime in the future to drive its unbalanced position. Further, Cellnet would impose an etiquette on use of the unlicensed spectrum that would reverse a long-standing Commission policy that has encouraged innovation in favor of a “lowest common denominator” policy that would not only stifle innovation, but that would cutoff services that provide enormous benefits to the public, such as affordable broadband to rural areas of the country.

Rather than impose an etiquette that clearly limits innovation and is detrimental to a wide variety of services, including rural broadband services, in existing unlicensed bands, the Commission should encourage relieving congestion in the bands while continuing to meet the demand for the growing variety of requirements, including those used by the utilities, petroleum companies and railroads. Specifically, Motorola supports two possible solutions. First, the Commission could provide additional spectrum for deployment of unlicensed devices. Motorola supports the Commission’s proposal to make available spectrum through the TV White Space initiative and is developing technology to maximize the use of this spectrum without interfering with the incumbent services. The TV White Space spectrum has similar or superior propagation characteristics to the 902-928 MHz band and therefore has the potential to make large

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<sup>13</sup> Other techniques include the ability to use frequencies beyond their current limited set (*see e.g.*, [http://www.itron.com/asset.asp?path=/products/specsheets/itr\\_014846.pdf](http://www.itron.com/asset.asp?path=/products/specsheets/itr_014846.pdf) which shows that the device uses only 10 MHz of the available 26 MHz), use acknowledgements and resends, coordination between the interferers and robust receiver and protocol design (spreading, coding, filtering, etc.).

amounts of spectrum available for rural broadband as well as a wide variety of other applications. The availability of this spectrum could help relieve some of the potential future congestion in the 902-928 MHz band.

Motorola supports requirements for use of the TV White Space that include use of a geolocation database, sensing and recognition of a beacon. This multilayered approach to incumbent protection also has benefits for sharing among unlicensed devices. For instance, sensing will help ensure an even distribution of use among available channels because devices will try to avoid noisy channels. Use of a geolocation database and support for beacon recognition provides the opportunity to prioritize traffic, even among unlicensed users, if the Commission deems it appropriate. Thus, important requirements, such as use by utilities, railroads, petroleum or other critical users may rate a higher priority for use of at least some channels in order to ensure reliable communications. It is important, however, for the Commission to implement the framework for allowing this kind of use at the beginning as it develops the rules. Imposing requirements after the band is developed and widely used for a variety of devices, as is being considered in the 902-928 MHz band, is not practical.

A second approach that provides a potential solution to relieve congestion and meet the needs of utilities is the concept of intelligent grid management over power lines. Electric utilities currently rely on the 902-928 MHz band to help monitor and control power consumption and manage their operations as efficiently as possible. With the development of broadband over power line (BPL) technology, a number of electric utilities are turning to BPL as a means to more intelligently monitor and manage their

operations.<sup>14</sup> As BPL develops and is more widely deployed, it proves an alternative for utilities so that they no longer have to rely on use of spectrum in an unlicensed and unprotected band.

The record of this proceeding clearly demonstrates that imposition of an etiquette in the existing unlicensed bands would harm innovation and severely limit the types of services and devices that could be deployed in the bands. Further, the record fails to show that a significant interference problem exists. The majority of commenters indicate that the myriad of devices in operation are able to successfully coexist. Motorola therefore urges the Commission to maintain its current rules and not impose unnecessary etiquette requirements that will hamper innovation and development.

Respectfully Submitted,

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<sup>14</sup> See e.g., “Case Study: 3One Networks Deploys Intelligent Power Grid Solution for Worlds Largest Utility Company”, available at <http://www.jdhunt.com/homeplug/jun07/3one.pdf>.