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Via Electronic Filing

July 1, 2004

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, N.W.
Washington, D.C. 20554

Re: *ET Docket No. 03-108*
WRITTEN EX PARTE COMMUNICATION

Dear Ms. Dortch:

Pursuant to Section 1.1206(b)(1) of the Commission's Rules, the Wireless Broadband Operators Coalition ("WBOC") hereby submits this *ex parte* letter to report new information and respond to the reply comments directed at WBOC's technical proposal in the above-captioned proceeding.¹

At the outset, WBOC is pleased to report the addition of the following new members, all of whom provide wireless broadband service over license-exempt spectrum areas:

SpeedNet Services, Inc. (www.speednet.com), headquartered in Omaha, NE, currently delivers license-exempt wireless broadband service to over 8,000 customers in 235 communities throughout the Midwest, including Kansas, Illinois, Indiana, Iowa, Nebraska, Ohio, Oklahoma, South Dakota and Texas. The company's mission is to bring affordable broadband service to underserved rural and other non-metropolitan areas. Serving both the residential and business markets, SpeedNet's broadband offerings are up to 20 times faster than conventional dial-up service.

Trillion Digital Communications (www.trillion21.com) was formed in 1997 to provide customized wireless broadband service to schools in underserved non-metro and rural markets in Alabama. Trillion has since expanded across the southeastern United

¹ See *Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies*, ET Docket No. 03-108, at ¶¶ 33-47 (rel. Dec. 30, 2003) ("NPRM").

States, using the license-exempt bands to provide a full menu of advanced voice, data and video services for the education, government and medical markets. The company has already built a customer base of over 900 schools in 60 districts across Alabama, Georgia, Tennessee, Florida, Kentucky, Louisiana, Mississippi, North Carolina and South Carolina, and is serving commercial, medical, industrial, and government (municipal, county and state) entities in those areas as well. In 2001, Trillion formed a sister company (Trillion Partners) which provides similar services in the western half of the country, including Arizona, California, Colorado, Kansas, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, Texas, Utah and Washington.

YYireless1.NET, LLC (www.yyireless1.net) recently launched its carrier-grade wireless broadband network in the “Golden Triangle” area of downtown Pittsburgh, PA, offering businesses customized point-to-point and point-to-multipoint “fast Ethernet” last mile and Internet access solutions at significantly lower cost than its wired competitors. The company also provides similar services to residential and business customers at nine locations in the suburbs of Pittsburgh, and is planning to expand its network to include 40 base stations in the Pittsburgh market. YYireless1.NET was founded by three former wireless telephony engineers with over 50 years of wireless engineering experience, and uses the license-exempt bands to deliver broadband at speeds 10 to 1,000 times faster than dial-up service.

AIR2LAN, Inc. (www.air2lan.com), based in Jackson, MS, provides license-exempt wireless broadband service to small and medium-sized businesses in metro markets in Mississippi, Louisiana, Alabama, Tennessee and Texas. In no small part due to a recent round of funding from ECD/HOPE (Enterprise Corporation of Delta/Hope Community Credit Union), Advantage Capital Partners, and the Louisiana Economic Development Corporation, AIR2LAN is expanding its existing service in New Orleans and launching new service in other communities in Louisiana, including areas in and around Monroe, West Monroe, Ruston, Bastrop, and Winnsboro.²

The diverse profile of WBOC’s new and existing members reaffirms the underlying theme of WBOC’s comments in this proceeding: the broadband needs of American consumers are not confined by geography, and thus the Commission should strive to extend the benefits of higher power, point-to-multipoint license-exempt wireless broadband service to all markets, not just “rural” areas as proposed in the *Notice of Proposed Rulemaking* (“NPRM”) for this proceeding.³ If adopted, WBOC’s technical

² The other members of WBOC are AMA Tech Tel Communications, LLC (Amarillo, TX); Prairie iNet LLC (West Des Moines, IA); NextWeb, Inc. (Fremont, CA); US Wireless Online (Louisville, KY), Pixius Communications LLC (Wichita, KS); and StoneBridge Wireless, Inc. (Burnsville, MN). Descriptions of each are attached hereto as Appendix A.

³ See Comments of Wireless Broadband Operators Coalition, ET Docket No. 03-108, at 2-3 (filed May 3, 2004) (“WBOC Comments”); see also Comments of Dell Corporation, ET Docket No. 03-108, at 2 (filed April 20, 2004) (“Dell urges the FCC to also consider the possibility for cognitive radio techniques to be applied in order to allow higher powered operations in all locations, not just rural areas. . . . An intuitive radio operating to minimize interference in the

proposal (as explained in the supporting technical statement by Kiwi Networks, Inc.) will achieve that objective by (1) leaving the maximum output power limit at 1 watt but redefining it as an average rather than an absolute number (“Maximum Average Interference Power” or “MAIP”), (2) permitting point-to-multipoint systems to increase spectral efficiency by adjusting instantaneous transmitter power,⁴ duty cycle and/or horizontal antenna beamwidth (*i.e.*, by deploying directional, higher gain antennas), provided that the 1 watt MAIP limit is not exceeded, and (3) requiring use of cognitive radio technology to mitigate interference in the limited number of cases where operation under the MAIP formula increases interference to other users of the license-exempt bands.⁵

At bottom, there is nothing radical or threatening about WBOC’s proposal – it is grounded in well-settled engineering principles already embedded in Part 15. For example, the Commission has long recognized that reducing duty cycle is a means of reducing interference to other spectrum users.⁶ Likewise, as pointed out in WBOC’s initial comments, “use of directional higher gain antennas does not change the overall amount of interference generated by the radio – it merely changes how different receivers within the antenna’s range will be affected. . . . As a result, the gain in signal strength from directional antennas can be used to increase range, building penetration, and/or system capacity, without increasing the overall interference injected into the RF environment.”⁷ Lastly, WBOC’s proposal takes advantage of the interference reduction capabilities of cognitive radio technology, but without relying on the controversial (at least in this proceeding) assumption that cognitive radios can be used to protect other receivers from interference. Instead, WBOC believes that service providers can and should use cognitive techniques to help *themselves* combat interference. An example of this is the concept of “multi-user diversity,” *i.e.*, where a particular radio experiences interference, it defers the transmit opportunity to another radio with superior channel conditions, and transmits only when channel conditions become more favorable for itself.⁸

unlicensed frequency bands could feasibly operate at higher power regardless of demographic/geographic designations.”).

⁴ For purposes of WBOC’s proposal, instantaneous transmitter power is defined as the amount of power entering the antenna port.

⁵ WBOC Comments at 4-10. WBOC’s proposal thus is in alignment with the request by Cingular/BellSouth and AT&T Wireless that the Commission focus on increasing antenna gain (which can be achieved by reducing horizontal beamwidth) without increasing output power. *See* Comments of Cingular Wireless LLC and BellSouth Corporation, ET Docket No. 03-108, at 20 (filed May 3, 2004); Reply Comments of AT&T Wireless Services, Inc., ET Docket No. 03-108, at 15-16 (filed June 1, 2004) (“AT&T Wireless Reply Comments”).

⁶ *See, e.g., Amendment of Part 90 of the Commission’s Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, 10 FCC Rcd 4695, 4737 (1995).

⁷ WBOC Comments at 6.

⁸ *Id.* at 8.

To further understand how WBOC's proposal fits into the Commission's broader regulatory scheme for license-exempt broadband service, it is useful to refer to the Commission's pending proposal in ET Docket No. 03-201 to effectively expand its Part 15 definition of "point-to-point" to include certain advanced, quasi-point to multipoint antenna technologies. There, as here, the Commission is attempting to expand higher power opportunities in the license-exempt bands to increase service to rural areas.⁹ Unlike here, however, the Commission is not proposing to achieve its pro-rural objectives in ET Docket No. 03-201 by imposing a geographical limitation on where the subject antennas may be used. Instead, the Commission is proposing to permit those antennas to operate anywhere provided that they comply with appropriate operating limitations.¹⁰ That is what WBOC is proposing in this proceeding for *de jure* point-to-multipoint operations in the license-exempt bands.¹¹

Significantly, *not a single party in this proceeding has submitted any technical data or other evidence that refutes anything in WBOC's proposal.* Instead, the small number of parties who opposed WBOC in their reply comments rely on cookie-cutter rhetoric or vague calls for further study, without a hint of engineering analysis or meaningful discussion of Commission precedent. For example, the Society of Broadcast Engineers ("SBE") asserts that WBOC's proposal "would be prone to all sorts of abuse" and would not reduce interference, without supplying any technical support for either

⁹ See *Modification of Parts 2 and 15 of the Commission's Rules for Unlicensed Devices and Equipment Approval*, 18 FCC Rcd 18910, 18911 (2003) ("We believe that the increased flexibility proposed herein will help to foster a viable last mile solution for delivering Internet services, other data applications or even video and voice services to underserved, rural, or isolated communities.") (*Advanced Antenna NPRM*). Notably, however, the *NPRM* in the instant proceeding appears to contemplate the possibility of permitting higher power Part 15 point-to-multipoint operations in areas not strictly defined as "rural." See *NPRM* at ¶ 36 ("This proposal will benefit persons living in rural areas *as well as persons living in other areas that may be underserved by spectrum based services.*") (emphasis added).

¹⁰ See *Advanced Antenna NPRM*, 18 FCC Rcd at 18913.

¹¹ WBOC agrees with those parties who have asked the Commission to ensure that higher power levels for point-to-multipoint systems in the license-exempt bands do not increase the absolute amount of out-of-band emissions ("OOBE") from license-exempt operations into adjacent licensed spectrum. See, e.g., Comments of Wireless Communications Ass'n Int'l, ET Docket No. 03-108, at 16-17 (filed May 3, 2003). In particular, certain parties have expressed concern that operation at higher power in the license-exempt bands will cause the absolute level of OOBE to exceed that currently permitted under Section 15.247(c), which requires that OOBE be at least 20 dB below the highest level of in-band power transmitted by a license-exempt device. WBOC is committed to complying with that requirement, such that the absolute amount of OOBE from higher power operations does not exceed that from operation at one watt, as calculated under the formula in Section 15.247(c). However, to eliminate any uncertainty about the matter, WBOC would not object to modification of Section 15.247(c) to (1) restate the rule's existing OOBE limit as an absolute number (i.e., whatever number equates to OOBE at 20 dB below the maximum in-band power of one watt) and (2) require that higher power Part 15 operations maintain OOBE at or below that number.

proposition.¹² Similarly, Sirius Satellite Radio Inc. and XM Radio Inc. make a generic assertion that “[m]ore widespread increases in unlicensed power would inevitably lead to more widespread interference to sensitive satellite DARS receivers,” without explaining how or why WBOC’s proposal would produce that result.¹³ And, while AT&T Wireless does not explicitly oppose WBOC’s proposal, it speculates that the proposal “could result in higher interference to licensed adjacent bands especially from unlicensed devices with a low transmit duty cycle,” without explaining how it arrived at that conclusion.¹⁴ Ultimately, none of this will do – as previously observed by Chairman Powell, “undue speculation about potential harm can always be invoked to justify continued regulation,”¹⁵ and such speculation is all that WBOC’s opponents have offered here.

Further, WBOC’s opponents fail to recognize a critical distinction between WBOC’s proposal and that in the *NPRM*. Unlike WBOC’s proposal, the *NPRM*’s proposal to permit all “rural” point-to-multipoint Part 15 systems to increase output power to six watts will only perpetuate (and perhaps even worsen) the fundamental flaw in Section 15.247 of the Rules: because the rule’s EIRP limit for point-to-multipoint systems always remains the same whether the system at issue is omnidirectional or not, the rule gives Part 15 point-to-multipoint service providers no incentive to directionalize their operations or do anything else to operate with greater spectral efficiency.¹⁶ In other words, omnidirectional, full duty cycle operations are inefficient whether output power is

¹² See Reply Comments of Society of Broadcast Engineers, ET Docket No. 03-108, at 2 (filed June 1, 2004). SBE strays into the realm of fiction when it suggests that WBOC’s model fails to assume secondary “no protection” status for Part 15 devices. See *id.* at 1. WBOC did not state that assumption because the point is obvious, and nowhere has WBOC said or even implied that Part 15 devices have any interference protection rights or have no obligation to protect licensed services under the Commission’s Rules.

¹³ See Reply Comments of Sirius Satellite Radio Inc. and XM Radio Inc., ET Docket No. 03-108, at 3 (filed June 1, 2004). The Commission has been down this road with Sirius and XM before. See, e.g., *Amendment of Part 15 of the Commission’s Rules Regarding Spread Spectrum Devices*, 17 FCC Rcd 10755, 10767 (2002) (“Sirius does not provide sufficient information for the Commission or interested parties to evaluate the validity of its claims [regarding out-of-band emissions from the license-exempt 2.4 GHz band]. For example, Sirius does not identify the basis of its proposed out-of-band emission limits, and it fails to address implementation or enforcement aspects of its proposal. If Sirius wishes the Commission to give its concerns full consideration it may file appropriate documentation with the Commission detailing its interference claims and describing what action might be appropriate to ameliorate such interference. However, we will not act on this matter herein.”).

¹⁴ See AT&T Wireless Reply Comments at 15 n.66.

¹⁵ Dissenting Statement of Commissioner Michael K. Powell re: *Rulemaking to Amend Parts 1, 2, 21 and 25 of the Commission’s Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, To Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services*, 14 FCC Rcd 21520, 21556 (1999).

¹⁶ See WBOC Comments at 6-7.

1 watt or 6 watts, so permitting higher output power by itself will do nothing to improve the usability of the license-exempt bands for point-to-multipoint broadband service.¹⁷ As recently noted by a prominent equipment vendor for license-exempt broadband systems:

[The Commission] should structure rules that promote innovation by steering clear of static type rules (e.g. x type of modulations only) and avoiding rules that make all systems equal, regardless of their efficiency. For example, the current Part 15 rules have no mechanism for rewarding efficient products or penalizing spectrally “unfriendly” products. This is leading to the proliferation of inefficient, noisy products that are easy to product and cheap to make. Such products are weighted equally in the current rules. The result is less efficient use of the spectrum and fewer operators being able to co-locate within a given market. In other words, the unlicensed spectrum ends up becoming “dumbed down” and the incentive for vendors to innovate is eroded.¹⁸

In sum, the WBOC model “represent[s] a reasonable engineering compromise between the risks of increased interference and the desire to accommodate new technologies.”¹⁹ If adopted in its entirety, it will achieve the Commission’s objective of extending license-exempt broadband service to rural areas in a spectrally efficient manner, but without leaving consumers in non-rural areas behind or ensnaring the Commission in a contentious debate over how a “rural” area should be defined under Part

¹⁷ See *Advanced Antenna NPRM*, 18 FCC Rcd at 18911 (“Omnidirectional antennas radiate and receive equally in all directions. While a system of this type is adequate for simple RF environments, the omnidirectional approach reaches desired users with only a small percentage of the overall energy sent out into the environment; signals that miss intended users represent wasted energy and could become interference to other users.”).

¹⁸ Comments of Alvarion, Inc., GN Docket No. 04-163, at 3 (2004). Alvarion’s observations are especially relevant in the wake of the Commission’s recent proposal to permit Part 15 point-to-multipoint systems to operate with an output power limit of 1 watt in the vacant TV broadcast spectrum below 1 GHz. See *Unlicensed Operation in the TV Broadcast Bands*, ET Docket No. 04-186, FCC 04-113 (re. May 25, 2004). Given the sensitivities within the broadcast industry about potential interference, the Commission can and should do whatever is appropriate in that proceeding to promote directionalization and other spectral efficiencies among license-exempt providers who seek to use the TV broadcast spectrum for broadband and other services.

¹⁹ *Amendment of Part 15 of the Commission’s Rules Regarding Spread Spectrum Devices*, 15 FCC Rcd 16244, 16249 (2000).

SPEEDNET SERVICES, INC.

/s/
Greg Sloma, Executive Vice President and
Chief Financial Officer

TRILLION DIGITAL COMMUNICATIONS

/s/
Terry Johnson, Chief Executive Officer

YYIRELESS.NET, LLC

/s/
Timothy J. Pisula, Chief Executive Officer

AIR2LAN, INC.

/s/
Jai Bhagat, Chief Executive Officer

cc: Ed Thomas
Julius Knapp
Bruce Franca
Lauren Van Wazer
Jim Schlichting
Sheryl Wilkerson
Jennifer Manner
Samuel Feder
Barry Ohlson
Paul Margie

APPENDIX A

The following companies are members of WBOC:

- ***AMA Tech Tel Communications LLC*** (www.amatechtel.com) provides a variety of license-exempt broadband services with a wireless footprint covering over 20,000 square miles in and around Amarillo, Texas. The company currently has over 4,000 wireless broadband subscribers (making it one of the largest providers of wireless broadband service in the United States) and anticipates adding 8,000 more within the next 12-18 months. AMA's deployment is a sophisticated, contiguous network that provides carrier class broadband service to residential, corporate and educational campuses. Using multiple unlicensed bands, AMA has created private virtual environments for three college campuses, multiple school systems, law enforcement and public safety agencies, hospitals, and numerous banks within its expanding footprint. Last year the company announced its groundbreaking partnership with Texas Tech University to build and maintain a wireless broadband telecommunications backbone stretching from Amarillo to Hobbs, New Mexico. The backbone will provide access to high-speed telecommunications to the rural communities along its route. Principally, the backbone will be a wide-area network for delivery of content to be used in small business development, work force training, and other adult and K-12 educational programs.
- ***Prairie iNet LLC*** (www.prairieinet.net) provides license-exempt broadband service in the license-exempt 2.4 GHz and 5.8 GHz bands to approximately 4,000 subscribers in over 120 communities in Iowa and Illinois, with a waiting list of another 2,000 customers. In addition to residential and business customers, Prairie INet provides service to schools, medical clinics and municipal governments. The company estimates that it is the sole provider of broadband service in approximately 50% of its markets.
- ***NextWeb, Inc.*** (www.nextweb.net) is the largest and fastest growing wireless Internet service provider in the United States. NextWeb provides service to more than 2,000 enterprise customers in the largest metropolitan markets in California including the San Francisco Bay Area, Silicon Valley, Los Angeles and Orange County. The company's service area encompasses over 175 cities across nearly 3,000 square miles and covers 50,000 small and medium-sized enterprises in population centers that include nearly 25 million households.
- ***US Wireless Online*** (www.uswo.net), based in Louisville, KY, is a publicly-held company that provides business and residential wireless broadband

- service over metro-area networks in Kentucky, Georgia, Ohio and Indiana. Approximately 24,000 users access the Internet with high-speed connections through the company's more than 500 enterprise customers. The company recently announced plans to implement a non-line of sight wireless overbuild in Louisville that will provide most of the city's metropolitan area with a portable wireless broadband alternative.
- ***Pixius Communications, LLC*** (www.pixius.com) provides wireless broadband service to 36 counties in the state of Kansas, encompassing 210,552 households and a population of 545,220, representing nearly half of the households and population in those counties. Since Pixius' service is not limited to the borders of a town or city, many of its customers are in rural areas where no one else offers broadband service. Initial funding for the network was provided by a group of local (Wichita, KS) investors. In March 2003, Pixius obtained funding from the USDA-RUS Pilot Broadband Loan Program, allowing the company to expand its network at a pace greater than that possible under the private investment model.
- ***StoneBridge Wireless, Inc.*** (www.sbwireless.net) provides wireless broadband service via approximately 45 transmission towers in Minneapolis, MN, western Wisconsin and surrounding suburban and rural communities, with additional facilities to be constructed this year in Michigan and Oklahoma. Many of StoneBridge's customers are beyond the reach of any cable modem or DSL service. The company recently received nearly \$5M in RUS funding to support the continued expansion of its wireless broadband networks.