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Federal Communications Commission
Office of the Secretary

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

In the Matter of:	)	
	)	
Amendment of Part 20 of the Commission's Rules	)	RM No.
to Establish Standards for the Certification of	)	
Mobile Power Amplifiers or Handset Amplifiers	)	
for Use in the Commercial Mobile Radio Services	)	

PETITION FOR RULEMAKING

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SUMMARY

Wilson Electronics, Inc. ("Wilson") — a leading manufacturer of cellular amplifiers and antennas in North America — asks the Commission to initiate a rulemaking to amend Part 20 of its rules to establish standards for the certification of mobile power amplifiers or handset amplifiers for subscriber use in the Commercial Mobile Radio Services ("CMRS"). The adoption of such standards will free consumers to choose the devices they need to enhance their wireless service; help deploy broadband services in rural America; promote public safety; bring network openness to wireless telecommunications; and afford manufacturers like Wilson the freedom to innovate without permission and intimidation.

A properly designed broadband amplifier can boost any handset's signal and dramatically improve network coverage without harming network performance. Handset amplifiers can help bring broadband access service to rural America just as they helped make reliable cellular service available in rural areas. However, CTIA — The Wireless Association® ("CTIA") is asking for a Commission ruling that wireless bi-directional repeaters and boosters may be marketed only for use by persons who are authorized by licensees to operate the devices.

Wilson agrees with CTIA's claim that low quality amplifiers and repeaters can cause interference to both CMRS networks and public safety systems. But Wilson does not agree that the problem is best solved by empowering licensees to deny the right of consumers to choose to use mobile amplifiers that are authorized by the Commission, compatible with the carrier's system, and cause no interference. The best solution, and one consistent with open networks policies, is for the Commission to adopt equipment certification requirements to ensure that mobile amplifiers will not interfere with network operations and leave it to consumers to choose whether to use such certificated devices.

Implicit in CTIA's request that carriers be empowered to certify boosters and repeaters for sale and use of their system is that carriers will employ a fair certification process in which their decisions will be based on published and reasonable technical standards that are objectively applied. Carriers cannot be entrusted to certify equipment unless the Commission is confident that carriers will adhere to the principles of "non-discrimination" and "transparency." Regrettably, Wilson's experience is that domestic carriers are discriminatory and anything but transparent in their network management practices when it comes to handset amplifiers.

Published, reasonable technical standards are absolutely essential to non-discriminatory and transparent certification of handset amplifiers. Wilson found domestic wireless carriers to be without such standards. Because equipment manufacturers cannot be expected to meet the requirement of 10 or more carriers, it falls to the Commission to codify and administer the technical standards by which handset amplifiers can be certificated.

CTIA contends that the benefits individual consumers derive from the use of handset amplifiers are outweighed by the detrimental effect certain of these devices will have on carriers' networks. In particular, CTIA placed blame on the inexpensive devices that can go into self-oscillation. It appears indisputable that handset amplifiers can be robustly designed and marketed with the oscillation detection technology and shutdown logic necessary to prevent interference to wireless networks. That being the case, the Commission can protect wireless network from the interference caused by the sale and use of low quality boosters and repeaters by adopting a rule that provides that only boosters and repeaters manufactured with integrated oscillation shutdown protection will be certificated for use in the CMRS.

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To: The Commission

PETITION FOR RULEMAKING

Wilson Electronics, Inc. ("Wilson"), by its attorney and pursuant to § 1.401(a) of the Commission's Rules ("Rules"), hereby petitions the Commission to initiate a rulemaking to amend Part 20 of the Commission's Rules ("Rules") to establish standards for the certification of mobile power amplifiers or handset amplifiers for subscriber use in the Commercial Mobile Radio Services ("CMRS").[1] In support thereof, the following is respectfully submitted:

INTRODUCTION

The Commission is in the process of preparing a national broadband plan to facilitate the build-out and utilization of high-speed broadband infrastructure with the goal of providing every American access to robust broadband services.[2] Achieving that goal will require a collaborative effort of all stakeholders: industry, government at all levels, large and small businesses, and American consumers.[3] Wilson believes that with such collaboration, existing signal enhancement technology can play a significant role in the cost-effective deployment of broadband services by delivering last-mile broadband to consumers in rural areas.

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[1] For the proposed rule changes, *see infra* Attachment 1.

[2] *See A National Broadband Plan for Our Future,* 24 FCC Rcd 4342, 4343-44 (2009).

[3] *See id.* at 4344.

Rural America has long been unserved or underserved by broadband technology. Bringing ubiquitous and affordable broadband services to rural areas has become a national priority.[4] Broadband build-out to rural America will enhance the quality of education, healthcare, and public safety in rural communities and "will help to improve America's economy, its ability to compete internationally, and its unity as a nation."[5] However, deploying broadband across vast rural lands will be a daunting task, [6] but one in which wireless services will play a critical role.[7]

Wireless technologies are capable of extending broadband into areas unreachable by wireline technologies and enable consumers to be connected while on the move. Because wireless infrastructure costs are less than comparable wireline broadband deployments, wireless broadband can provide efficient and cost-effective connectivity in low-population-density rural areas. To reduce the costs of wireless infrastructure in rural areas, the Commission already permits CMRS providers (cellular, PCS, AWS and certain 700 MHz licensees) to increase the range of their systems in rural areas by operating at twice the power allowed in non-rural areas.[8] Clearly, the use of repeaters to regenerate a signal over long distances is another cost-effective means to deliver affordable last-mile broadband access service in rural areas.

The increased power limit for base transmitters will not expand coverage for mobile

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[4] *See* Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246 § 6112, 122 Stat. 923, 1966 (2008).

[5] *See* Michael J. Copps, *Bringing Broadband to Rural America: Report on a Rural Broadband Strategy* 8 (2009), available at http://wireless.fcc.gov/outreach/index.htm?job= broadband_home.

[6] *See id.* at 3.

[7] *See id.* at 62.

[8] *See Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services,* 19 FCC Rcd 19078, 19126-33 (2004). *See also Service Rules for the 698-746, 747-762 and 777-792 MHz Bands,* 22 FCC Rcd 8064, 8099-100 (2007).

broadband access in rural America unless handsets are capable of returning a signal to the base station antenna. That capability is easily provided by the use of mobile power amplifiers or handset amplifiers which are, in Part 2 parlance, nothing more than mobile "external radio frequency power amplifiers."[9] From its experience as one of the oldest and largest manufacturers of cellular amplifiers and antennas in North America, Wilson knows that a properly designed broadband amplifier can boost any handset's signal and dramatically improve network coverage without harming network performance.

Wilson designs, manufactures, and sells amplifiers, antennas and other components that improve wireless service coverage in the car, home, or office.[10] Wilson's amplifiers and antennas solve many of the problems of dropped calls, lost data and transmission quality issues that users routinely experience on every wireless network. Wilson's products operate in the frequency ranges of all major systems in the United States and Canada and amplify transmissions for all mobile phones, as well as wireless modems used in laptops or other wireless devices.[11]

There has been a tremendous demand for Wilson amplifiers. They have been purchased by over 500 government entities, including police and fire departments, federal agencies, including the Department of Homeland Security and the FBI, and state and local agencies,

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[9] An external radio frequency power amplifier is "any device which, (1) when used in conjunction with a radio transmitter as a signal source is capable of amplification of that signal, and (2) is not an integral part of a radio transmitter as manufactured." 47 C.F.R. § 2.815(a).

[10] Wilson was founded in 1999 by James W. Wilson, a 40-year veteran of the wireless industry. Wilson began manufacturing cellular antennas and expanded into cellular amplifiers in 2002. It is headquartered in St. George, Utah and currently employs approximately 200 people, including a dozen engineers.

[11] Wilson sells its products using a two-tiered distribution system to a growing market of consumers, mobile professionals and business users through a network of more than 3,000 specialty retail and carrier stores in the U.S. and Canada, and is currently expanding into Latin America and other locations around the globe.

including E911 centers, and the United States military. Wilson amplifiers are used by businesses in every segment of the nation's economy, but particularly those that work in rural areas in such fields as energy exploration, transportation, power, and forestry. Wilson's business customers also include wireless service providers seeking to offer more reliable service and expanded coverage to their customers in rural America. And Wilson has sold cellular amplifiers to CMRS consumers who rely on the devices to ensure, extend and enhance their wireless service. The fact that Wilson has sold more than two million amplifiers and antennas since 2001 — 150,000 amplifiers last year alone — demonstrates that there is a genuine public/consumer need for the devices.

Handset amplifiers can help bring broadband access service to rural America just as they helped make reliable cellular service available in rural areas. However, CTIA — The Wireless Association® ("CTIA") is asking for a Commission ruling that wireless bi-directional amplifiers and repeaters may be marketed only for use by persons who are authorized by licensees to operate the devices.[12] CTIA argues that the operation of boosters or repeaters purchased over the Internet or from big-box electronics retailers has caused interference to wireless networks:

> These devices are inferior to those that licensees market to consumers and are often sold without any warnings about required authorization from licensees. Low cost/quality repeaters lacking, for example, oscillation safety measures and proper shutdown logic result in degraded network coverage and quality of service, and the diversion of significant carrier resources to finding and addressing the source of interference.[13]

Wilson agrees that technically deficient amplifiers and repeaters are being marketed to consumers. In fact, Wilson filed suit against the manufacturers of cellular amplifiers that

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[12] *See* CTIA, *The Need for FCC Action on Unauthorized Repeaters* 6 (July 27, 2009) (CTIA Presentation"); CTIA, Petition for Declaratory Ruling 10-14 (Nov. 2, 2007) ("CTIA Petition"); CTIA, *White Paper on the Harmful Impacts of Unauthorized Wireless Repeaters* 1 (May 1, 2006) ("CTIA White Paper").

[13] CTIA Presentation at 3.

actually reduce a handset's signal and degrade the user's service.[14] Wilson also agrees that low quality amplifiers and repeaters can cause interference to both CMRS networks and public safety systems. But Wilson does not agree that the problem is best solved by empowering licensees to deny the right of consumers to choose to use mobile amplifiers that are authorized by the Commission, compatible with the carrier's system, and cause no interference. The best solution, and one consistent with open networks policies, is for the Commission to adopt equipment certification requirements to ensure that mobile amplifiers will not interfere with network operations and leave it to consumers to choose whether to use such certificated devices.

I. THERE IS AN UNDENIABLE PUBLIC NEED FOR BROADBAND HANDSET AMPLIFIERS ESPECIALLY IN RURAL AMERICA

In attempting to make the case for restricting subscriber use of signal enhancement technology, CTIA demonstrated why consumers should have unfettered access to Commission-certificated, non-harmful mobile amplifiers. CTIA correctly noted that the Commission has identified significant public safety-related functions that are performed by CMRS providers in connection with E911, Priority Access Service ("PAS") and Emergency Alert Service ("EAS"). With respect to E911, CTIA referred to the Commission's finding that "the ability to reach 911 in an emergency situation is one of the most important reasons Americans give for purchasing wireless phones."[15] With regard to PAS, CTIA noted that the Commission had recognized that "Federal, State and local government public safety organizations are increasingly using CMRS

[14] *See Wilson Electronics, Inc. v. Call Capture, I.W.R.E., Inc., MOGO Wireless, Inc. and 3XA Wireless, Inc.*, No. 2:08-cv-242 (D. Utah Mar. 27, 2008).

[15] CTIA Petition at 4 (quoting *Revisions of the Rules to Ensure Compatibility with E911 Emergency Calling Systems*, 14 FCC Rcd 17388, 17389 (1999)).

systems."[16] Finally, it quoted the Commission's acknowledgement in an EAS rulemaking that "[w]ireless products are becoming an equal to television and radio as an avenue to reach the American public quickly and efficiently."[17]

CTIA did not address how CMRS providers can perform public-safety related functions in areas where their signal strength is weak or where their signal is blocked or shielded. In those areas, unless the CMRS provider's signal is amplified, subscribers will be unable to reach 911 in an emergency situation; government public safety organizations will not be able to use CMRS; and subscribers will not be notified of emergencies. That fact was tragically demonstrated on January 6, 2008, when nine people were killed and 43 injured in a bus accident near Mexican Hat in rural San Juan County, Utah.

The Mexican Hat accident involved a bus carrying 52 passengers returning from a ski trip to Telluride, Colorado. The bus careened off an embankment, overturned, and came to rest in a drainage ditch. During the rollover, the roof of the bus was torn off, and 50 of the passengers were ejected. The motorist who discovered the accident had to drive for 36 minutes before he could get cellular service and report the accident. It was only after the Mexican Hat tragedy that cellular repeaters were installed near the accident site.

The 36-minute delay in reporting the Mexican Hat accident prompted the National Transportation Safety Board ("NTSB") to warn of the risk of motorcoach travel in rural areas that lack the wireless coverage essential to make 911 calls from wireless handsets.[18] The NTSB

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[16] CTIA Petition at 4 (quoting *Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements through the Year 2010,* 15 FCC Rcd 16720, 16725 (2000)).

[17] *Id.* (quoting *Review of the EAS,* 20 FCC Rcd 18625, 18653 (2005)).

[18] NTSB Safety Recommendation, H-09-9, at 4 (May 29, 2009) ("NTSB Recommendation"). Attachment 2 hereto is a copy of the NTSB Recommendation.

announced that wireless coverage of the nation's highway system is necessary to "improve accident notification for emergency medical service response and coordination of prehospital transportation."[19] It warned that until coverage is "extended along highly traveled rural roads, motor carriers servicing rural areas without wireless telephone coverage remain at risk of being unable to report an accident or emergency in those locations."[20] Recognizing "the amount of time that will be required to develop the infrastructure necessary for wireless communications along rural roads,"[21] the NTSB issued a recommendation to the American Bus Association and the United Motorcoach Association to advise their members "to carry mobile cellular amplifiers or satellite-based devices to communicate emergency events."[22] The NTSB named Wilson as a manufacturer of mobile amplifiers that "can be used to amplify weak cellular signals in rural areas."[23]

The NTSB is far from the only governmental agency to recognize the significant public safety-related functions that are performed by mobile amplifiers. Rural and metropolitan police departments install mobile amplifiers in their patrol cars to extend cellular coverage into remote areas, to improve the quality of voice and data communications, and to reduce the number of dropped calls. Increasingly, mobile amplifiers are employed in patrol fleets to ensure officers have stable connections for their laptop computer systems to receive dispatch assignments, search records, and report emergencies. More than a year before the Mexican Hat tragedy prompted cellular operators to extend coverage to the accident site, the San Juan County sheriff's

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[19] NTSB Recommendation at 4.

[20] *Id.*

[21] *Id.* at 4-5.

[22] *Id.* at 5.

[23] *Id.* at 5 n.7.

office and its search and rescue teams installed Wilson cellular amplifiers in their vehicles as a safety measure. They remain in use today.

II. THE COMMISSION SHOULD CORRECT THE MISCONCEPTION THAT SUBSCRIBER USE OF HANDSET AMPLIFIERS IS PROHIBITED

Authorization for subscribers to operate mobile stations — including mobile or handset amplifiers — is included in the CMRS authorization held by the licensee providing their service.[24] Nevertheless, mobile amplifiers are not being used to their full advantage in rural America because of the misconception within the Commission and the industry that such devices can only be used by subscribers with the consent of their licensed system operators. That misconception appears to come from the failure to see the distinctions between mobile amplifiers and the traditional repeaters, signal boosters, and in-building radiation systems that are certificated for use in the CMRS.

The most obvious distinction is that traditional repeaters and boosters are, by definition, stationary transmitters.[25] There are significant regulatory ramifications to that distinction. Depending on output power and site of deployment, fixed repeaters can extend the service area or contour of a CMRS base station. Thus, they can cause co-channel and adjacent-channel interference and unauthorized service area boundary extensions. Although fixed stations can be operated by subscribers under their service provider's CMRS license,[26] the Rules generally assume the use of fixed repeaters and signal boosters by licensees and prohibit their use to extend a licensed service area.

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[24] *See* 47 C.F.R. §§ 1.903(c), 22.3(b).

[25] *See infra* Attachment 3 at 1 n.1 (Russell Lukas, *Applicable Law on Handset Amplifiers* (Sept. 22, 2009)).

[26] *See* 47 C.F.R §§ 1.903(c), 22.3(b).

CMRS subscribers in good standing are considered to be operating their mobile stations — including handset amplifiers — not only under their service provider's authorization, but under the authorization of any licensee that temporarily provides their service.[27] Operation of mobile amplifiers cannot either cause cognizable interference or extend a licensed service area.[28] Subscriber use of handset amplifiers simply do not trigger even the minimal regulatory concerns raised by their stationary counterparts.

CTIA has been unable to point to a single Commission rule that would prohibit a subscriber in good standing from using a handset amplifier certificated for use in the CMRS. As CTIA unintentionally demonstrated, there is no such rule. Unfortunately, there have been seemingly authoritative statements directed at stationary repeaters that can be misconstrued and misapplied to mobile amplifiers.[29] In that respect, Wilson applauds CTIA's attempt to end the legal uncertainty surrounding the widespread use of allegedly "unauthorized wireless repeaters and signal boosters to optimize coverage in ... homes, cars, boats and offices."[30] But it suggests that the Commission should both end the uncertainty and acknowledge the public demand for such devices by initiating a rulemaking to adopt equipment certification requirements that will ensure that the wireless devices that subscribers choose to use to maximize coverage will not harm their wireless networks.

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[27] *See* 47 C.F.R. §§ 22.571, 22.927.

[28] *See infra* Attachment 3 at 9 & nn. 35, 36. The down link power of a handset amplifier is very low, typically 10 dBm. Handset amplifiers are generally operated in a shielded environment, such as in a vehicle.

[29] *See id.* at 6-7, 10.

[30] CTIA Petition at 10.

III. CARRIERS CANNOT BE PERMITTED TO PREVENT SUBSCRIBERS FROM USING NON-HARMFUL HANDSET AMPLIFIERS OF THEIR CHOICE

It seems likely that the Commission will codify open network principles that will prevent broadband providers from prohibiting users from attaching non-harmful devices to their networks and require them to be transparent about their network management practices.[31] The Commission already moved in that direction with the adoption of its four consumer-based principles in its 2007 internet policy statement[32] and by implementing open network policies in licensing decisions[33] and in one wireless rulemaking.[34] Yet, CTIA is pressing the Commission to move in the totally opposite direction by issuing a declaratory ruling prohibiting the sale and use of wireless repeaters and boosters without the consent of the licensee of the wireless network.[35] CTIA is not only bucking the trend toward network openness, but it is attempting to bypass notice-and-comment requirements.

As we have shown, there is no rule that currently prohibits the sale and use of conventional repeaters, much less handset amplifiers. The prohibition that CTIA seeks would

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[31] *See* Julius Genachowski, *Preserving a Free and Open Internet: A Platform for Innovation, Opportunity, and Prosperity*, 2009 WL 2997597 (prepared remarks before The Brookings Institute Sept. 21, 2009). *See also A Broadband Plan for Our Future,* 24 FCC Rcd 4342 (2009).

[32] *See Appropriate Framework for Broadband Access to the Internet over Wireline Facilities,* 20 FCC Rcd 14986, 14988 (2005) ("*Internet Policy Statement*").

[33] The Commission has imposed compliance with the *Internet Policy Statement* as a condition of approving mergers of major wireline carriers, *see, e.g., Verizon Communications Inc. and MCI, Inc.,* 21 FCC Rcd 18433, 18509 (2005) (applicant voluntarily agreed to the condition), but not major wireless carriers. *See, e.g., Cellco Partnership d/b/a Verizon Wireless and Atlantis Holdings LLC,* 23 FCC Rcd 17444, 17528-29 (2008) (applicant refused to accept condition).

[34] In the 700 MHz auction, the Commission adopted a requirement for licensees in the 700 MHz Upper C Block to provide an open platform for devices and applications. *See Service Rules for the 698-746, 747-762, and 777-792 Band; Implementing a Nationwide Broadband Interoperable Public Safety Network in the 700 MHz Band,* 22 FCC Rcd 15289, 15358-74 (2007).

[35] *See* CTIA Presentation at 6; CTIA Petition at 10-14.

constitute a rule.[36] The Commission cannot supply a missing rule by issuing a declaratory ruling. If it feels strongly that licensees should be able to dictate what equipment can be marketed to consumers or to set the standards by which equipment may be approved for use by consumers, CTIA should petition the Commission to initiate the rulemaking necessary to place such power in the hands of wireless carriers. This petition evidences Wilson's strong belief that equipment standard-setting should remain in the unbiased hands of the Commission.

Wilson can report that it has seen no evidence that the cellular industry leaders are "moving towards more open platforms."[37] Under its vaunted Open Development Initiative ("ODI"), Cellco Partnership d/b/a Verizon Wireless ("VZW") purports to allow anyone to design devices for its network so long as the device completes a certification process to ensure it meets certain technical specifications.[38] Wilson spent nearly 18 months attempting to have its handset amplifiers approved by VZW.[39] During that time, VZW never informed Wilson of its ODI program or any other process for obtaining equipment certification.[40]

In July 2009, VZW simply notified Wilson that its product: (1) did not meet VZW's

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[36] The ruling CTIA requests would be a Commission "statement of general or particular applicability and future effect designed to implement, interpret, or prescribe law or policy." 5 U.S.C. § 551(4).

[37] *Verizon Wireless,* 23 FCC Rcd at 17528.

[38] *See id.*

[39] Beginning in January 2008, Wilson attempted to work informally with Verizon Wireless to allay its technical concerns. In November 2008, Wilson sent Verizon Wireless a video and a written report that specifically addressed technical issues it had raised. After waiting five months for Verizon Wireless to respond, Wilson asked Verizon Wireless to provide it with information as to the procedure it must follow to have its equipment tested and the standards its equipment must meet to be approved. Verizon Wireless never responded to that request.

[40] Wilson independently learned of the existence of VZW's ODI program on July 21, 2009, but was unable to access the ODI "Device Certification Portal." It was also unsuccessful in reaching the ODI program by letter, email and telephone. Wilson finally received a response from the ODI program on August 21, 2009.

published "network and safety requirements" and (2) "generated (and has been known to produce) interference across multiple frequency bands for other wireless service providers and public safety." VZW referred Wilson to a third-party testing company, but pointedly stated that the referral was "only offered in the spirit of technical support" and did not imply any commitment to reconsider Wilson's handset amplifiers "based on a successful evaluation." It seems that VZW's "[n]ew product selections are not made solely on technical merit" but also on "business needs." Wilson subsequently learned that VZW has no published network requirements for mobile amplifiers and no test plan for such equipment.

Implicit in CTIA's request that carriers be empowered to certify boosters and repeaters for sale and use of their system is that carriers will employ a fair certification process in which their decisions will be based on published and reasonable technical standards that are objectively applied. Carriers cannot be entrusted to certify equipment unless the Commission is confident that carriers will adhere to the principles of "non-discrimination" and "transparency."[41] Regrettably, Wilson's experience is that domestic carriers are discriminatory and anything but transparent in their network management practices when it comes to handset amplifiers.[42] That point is proven by VZW's professed willingness to disapprove equipment — for business reasons — that meets its technical specifications.

Published, reasonable technical standards are absolutely essential to non-discriminatory and transparent certification of handset amplifiers. Wilson found VZW and AT&T to be without

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[41] Genachowski, *supra,* 2009 WL 2997597, at *5.

[42] Wilson's experience working with AT&T Mobility LLC ("AT&T") was similar to its experience with VZW. Although it dispatched a representative of its enginering group to visit Wilson's manufacturing and engineering facility in St. George, Utah, AT&T ultimately informed Wilson that it would not approve any broadband handset amplifiers. In contrast, Canadian carriers worked extensively with Wilson to set technical standards and to test and evaluate amplifiers. Two such carriers have approved and purchased over 40,000 Wilson handset amplifiers.

such standards. To fill that void, Wilson briefly advocated the adoption of industry-wide standards, but abandoned the effort as futile in the face of carrier resistance. Because equipment manufacturers cannot be expected to meet the requirement of 10 or more carriers, it falls to the Commission to codify and administer the technical standards by which handset amplifiers can be certificated.

IV. PROPERLY DESIGNED BROADBAND HANDSET AMPLIFIERS DO NOT HARM WIRELESS NETWORKS

CTIA conceded in 2006 that boosters "may better enable service for the party operating them."[43] It also recognized that "[c]onsumers across the nation have been installing wireless repeaters/boosters in their homes, cars, boats, and offices in an attempt to improve their wireless coverage."[44] But CTIA contended that the benefits to individual consumers are outweighed by the "detrimental effect *certain* of these devices will have on carriers' networks."[45] In particular, CTIA placed blame on the inexpensive devices that can "go into oscillation."[46]

The phenomenon known as "oscillation" is caused when an amplifier's two antennas are placed too close together creating an uncontrolled, continuous wave signal which radiates through the antennas. The oscillation can interfere with the receivers at the base station as well as in the receiver in the handset. According to AT&T, the "network then interprets the signal as external noise, which results in electronic 'commands' being transmitted to the cell phone to increase its transmit power in an effort to overcome the perceived noise. This action effectively constricts the scope of coverage of the affected cell site sector, causing other users' cell phones

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[43] CTIA White Paper at 1.

[44] *Id.* at 11.

[45] *Id.* at 14 (emphasis added).

[46] *Id.* at 12.

to drop calls and lose coverage."[47]

CTIA contends that the "[m]ore robustly developed repeaters installed by carriers can detect when the transmitter has gone into oscillation and automatically shut down transmission until the device is serviced and corrected."[48] So too can Wilson handset amplifiers. Independently conducted tests in July 2008 showed that Wilson's oscillation protection technology worked flawlessly to detect oscillation and shut down the amplifier within 10 milliseconds. The tests demonstrated that handset amplifiers with anti-oscillation technology will not interfere with, and be invisible to, the wireless network. In fact, since Wilson introduced its anti-oscillation technology in late 2006, it has sold more than 150,000 wireless amplifiers with oscillation protection without receiving a single report that an amplifier went into sustained oscillation.

It appears indisputable that handset amplifiers can be robustly designed and marketed with the oscillation detection technology and shutdown logic necessary to prevent interference to wireless networks. That being the case, the Commission can protect wireless networks from the interference caused by the sale and use of low quality boosters and repeaters by adopting a rule that provides that only repeaters, boosters and handset amplifiers manufactured with integrated oscillation shutdown protection will be certificated for use in the CMRS.[49]

Some wireless carriers contend that repeaters, boosters, and mobile amplifiers increase the noise floor in the vicinity of base station/cell site transmitters. Wilson's high-gain amplifiers incorporate gain control that senses the forward link signals of a base station transmitter and

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[47] *AT&T Mobility, LLC v. Digital Antenna, Inc.*, No. 09-60639, at 6 (S.D. Fla. Apr. 30, 2009).

[48] CTIA White Paper at 12.

[49] For a procedure to test for oscillation protection that can be used in the certification process, *see infra* Attachment 4 (Richard Kline & Alan Van Buren, *Oscillation Protection in Cell Phone Booster Amplifiers* (June 10, 2009)).

switches off both forward link (base station to handset) and reverse link (handset to base station) amplification whenever the base station transmitter is in close proximity. Essentially, the gain control functions as an on/off switch that turns the amplifier off when cell site overload is possible. Because the handset amplifier is never in operation nearby a base transmitter, it cannot affect an increase in the noise floor that is harmful to the operation of the wireless network.

Whereas CTIA demonizes wireless bi-directional amplifiers, it is the use of wireless single-direction amplifiers that poses the threat to wireless networks. Reasonably balanced bi-directional amplification is essential to preserve the correct relative power balance between the reverse link and the forward link in CDMA (and most non-CDMA) systems.[50] Some amplifier manufacturers cut costs by completely eliminating amplification in one direction, thereby avoiding the need for many expensive RF components.[51] These single-direction amplifiers do not amplify the signal emanating from the consumer's handset. They work to actually degrade the quality of the consumer's wireless service.

When the consumer is using a single-direction amplifier on a CDMA system, the handset is deceived into perceiving that the base station/cell site transmitter is much closer than it actually is. This causes the handset to reduce its output signal when, in fact, it should have been increased to compensate for the increased distance from the base transmitter. At relatively great distances, such a reduction in the handset's signal is sufficient to prevent the initiation of outgoing calls and to cause incoming calls to be dropped. Consequently, single-direction amplifiers worsen communications when and where the amplifiers are needed most.

Wilson proposes that a rule be adopted that provides that single-direction amplifiers will

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[50] *See infra* Attachment 5 at 1 (Richard Kline & Alan Van Buren, *Gain Balance in Cell Phone Booster Amplifiers* (June 9, 2009)).

[51] *See id.*

not be certificated for use in the CMRS.[52] All handset amplifiers should be required by rule to have active and equal gain in both the forward link and the reverse link directions. Any gain imbalance should be required to be within acceptable limits.[53]

AT&T's refusal to even consider approving broadband handset amplifiers is typical of the position taken by domestic wireless carriers.[54] To the best of our knowledge, domestic carriers will only approve high-cost channelized amplifiers.[55] VZW, for example, claimed that it cannot approve broadband handset amplifiers because they are capable of operating not only on VZW's licensed frequencies, but on all the frequencies allocated for the particular service. Obviously, however, VZW would approve the handset amplifier for use only on its system. If the VZW-approved handset amplifier is used by a non-subscriber to place a call using his or her handset, the cellular amplifier will transmit the call on the system of the non-subscriber's licensed service provider under its license. Legally speaking, it is the same as when a VZW subscriber would use a VZW-approved handset amplifier when roaming in another carrier's service area.

No carrier has shown how the use of a properly-designed broadband handset amplifier can harm a wireless network. On the other hand, the use of such devices demonstrably benefits consumers. Broadband handset amplifiers are less expensive to purchase than channelized devices, and are more useful to consumers since they can be used on all CMRS systems. Broadband handset amplifiers are particularly beneficial to consumers in rural American who

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[52] There may be single-direction amplifiers in use with CMRS systems other than those licensed under Parts 22 and 24 of the Rules that are not harmful and may be certificated.

[53] *See infra* Attachment 5 at 10.

[54] *See supra* note 42.

[55] A broadband handset amplifier amplifies all signals within the passband of the device. A channelized or narrowband amplifier amplifies only those discrete frequencies intended to be retransmitted. *See generally* 47 C.F.R. § 90.7 (defining "signal booster").

often have to subscribe to the service of two carriers to be ensured of reliable wireless service. If it adopts certification requirements for broadband handset amplifiers, the Commission will serve both the consumers who demand to use such devices and the carriers who demand protection from interference caused by poorly designed amplifiers.

CONCLUSION

Wilson respectfully requests that the Commission issue a notice of proposed rulemaking for the purpose of codifying standards for the certification of handset amplifiers for use in the CMRS.[56] The adoption of such standards will free consumers to chose the devices they need to enhance their wireless service; help deploy broadband services in rural America; promote public safety; bring network openness to wireless telecommunications; and afford manufacturers like Wilson the freedom to innovate without permission and intimidation.

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[56] Wilson suggests that existing equipment certifications be grandfathered for a period of one year at the end of which time equipment manufacturers must meet the new certification requirements.

ATTACHMENT 1

PROPOSED AMENDMENT TO PART 20

Part 20 of Chapter 1 of Title 47 of the Code of Federal Regulations is amended as follows:

PART 20 —COMMERCIAL MOBILE RADIO SERVICES

1. The authority citation for Part 20 continues to read as follows:

Authority: 47 U.S.C. 154, 160, 201, 251-254, 303, and 332 unless otherwise noted.

2. Section 20.3 is amended by adding definitions for "handset amplifier," "in-building radiation systems," "repeater," and "signal booster" in alphabetical order to read as follows:

§ 20.3 Definitions.

* * * * *

Handset amplifier. A mobile external radio frequency power amplifier that automatically retransmits signals to or from hand-carried mobile stations with or without channel translation.

* * * * *

In-building radiation systems. Supplementary systems comprising low power transmitters, receivers, indoor antennas and/or leaky coaxial cable radiators, designed to improve service reliability inside buildings or structures located within the service areas of CMRS stations.

* * * * *

Repeater. A fixed transmitter that automatically retransmits the signals from base, fixed, mobile, and portable stations with or without channel translation.

* * * * *

Signal booster. A fixed transmitter that automatically retransmits the signals from base, fixed, mobile, and portable stations without channel translation for the purpose of improving the reliability of existing service by increasing the signal strength in dead spots.

3. A new Section 20.21 is added to read as follows:

§ 20.21 Certification of transmitters.

Except as provided in paragraph (d) of this section, transmitters used in the CMRS,

including handset amplifiers, in-building radiation systems, repeaters, and signal boosters must be certificated for use in the mobile services regulated under this part. Transmitters must be certificated when the station is ready for service, not necessarily at the time of filing an application.

(a) The FCC may list as certificated only transmitters that are capable of meeting all technical requirements of the rules governing the mobile service in which they will operate. The procedure for obtaining certification is set forth in part 2 of this chapter.

(b) The FCC may list as certificated only handset amplifiers with integrated oscillation shutdown protection and balanced bi-directional amplification.

(c) The FCC may list as certificated only repeaters, signal boosters, in-building radiation systems, and handset amplifiers that automatically protect nearby base stations from an increase in the cell site receiver noise floor.

(d) Transmitters operating under a developmental authorization do not have to be certificated.

4. A new Section 20.22 is added to read as follows:

§ 20.22 Handset amplifiers.

Subscribers in good standing to the services of any CMRS carrier may purchase and operate handset amplifiers of their choice, provided that the handset amplifiers have been certificated by the FCC for use in the mobile services regulated under this part.

5. A new Section 20.23 is added to read as follows:

§ 20.23 In-building radiation systems.

Subscribers in good standing to the services of any CMRS carrier may install and operate in-building radiation systems, provided that the locations of the in-building radiation systems are within the protected service area of the carrier's authorized transmitter(s) on the same channel or channel block and the subscribers notify the carrier in writing of the locations of such systems 15 days prior to their installation and operation.

ATTACHMENT 2