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

In the Matter of	)	
	)	
Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters	)	WT Docket No. 10-4
	)	
Wireless Telecommunications Bureau Seeks Comment on Kathrein Request for Waiver to Permit Equipment Certification for Sale of Mobile Phone Signal Booster	)	DA 15-834

JOINT COMMENTS OF V-COMM, WILSON ELECTRONICS AND CELLPHONE-MATE

In response to the FCC's request for comments, V-COMM,[1] Wilson Electronics and Cellphone-Mate have jointly provided comments opposing this request for wavier. [2]

V-COMM, Wilson Electronics, and Cellphone-Mate oppose Kathrein's request for waiver of the FCC's anti-oscillation and labeling requirements as outlined in rule parts

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[1] V-COMM, L.L.C. is a wireless engineering consulting firm with principal members having over 33 years experience in the wireless industry. We have provided our expertise to wireless operators in RF design, engineering, system performance, testing, optimization, and interference assessments. We have extensive laboratory and field testing experience, and have provided interference assessments and technical comments in many FCC proceedings. V-COMM has been retained by Verizon Wireless to analyze and comment on the Kathrein Waiver Request.

[2] Wilson Electronics, Inc. and Cellphone-Mate, Inc. are two manufacturers of consumer boosters. Wilson Electronics' signal boosters are marketed with the names Wilson, Weboost or Zboost. Cellphone-Mate's signal boosters are marketed as SureCall.

20.21(e)(5), 20.21(e)(8)(ii)(A), and 20.21(f), [3] and oppose its request for a determination that grants equivalent protection status pursuant to 20.21(e)(10), for certification and marketing its wideband consumer signal booster that does not comply with the Commission's rules or the Network Protection Standard (NPS).[4]

As outlined herein, Kathrein fails to provide any valid reason for the FCC to grant such waiver requests of its rules, nor does Kathrein provide reasons it cannot meet the FCC rules. As such, Kathrein's request should be denied.

All manufacturers of consumer signal boosters must fully comply with all FCC rules and the National Protection Standard for Consumer Signal Boosters. Consistent with the FCC's new regulatory framework adopted for consumer signal boosters pursuant to the Commission's Signal Booster Report and Order dated February 20, 2013, [5] all consumer signal boosters must meet the Commission's new rules and National Protection Standard for consumer signal boosters. These rules include new regulatory requirements for fixed and mobile type consumer signal boosters that are required for all consumer boosters sold after March 1, 2014.[6]

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[3] Kathrein's Request for Waiver of Section 20.21 of the Commission's Rules, WT Docket 10-4, filed July 15, 2015 ("Kathrein Waiver Request").

[4] V-COMM and Wilson Electronics are parties in the development of the Consolidated Proposal, which was the industry consensus standard that was adopted by the Commission into Part 20 rules and the NPS. As such, we are thoroughly familiar with all the requirements that are contained therein and codified to protect CMRS networks.

[5] FCC Signal Booster Order, FCC 13-21, Docket No. 10-4, Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage Through the Use of Signal Boosters, Report and Order, (FCC Signal Booster Order), adopted Feb. 20, 2013.

[6] 47 C.F.R. § 20.21(g) Marketing and sale of signal boosters. Except as provided in § 2.803 of this chapter, no person, manufacturer, distributor, or retailer may market, distribute or offer for sale or lease any Consumer Signal Booster that does not comply with the requirements of this section to any person in the United States or to any person intending to operate the Consumer Signal Booster within the United States at any time on or after March 1, 2014. Consumer Signal Boosters may only be sold to members of the general public for their personal use.

In addition, for reasons stated below, the Commission should provide a declaratory ruling and/or determination finding Kathrein's proposed consumer booster installation does not comply with section 20.21(d) of FCC rules requiring that consumer boosters maintain the ability for operators to deactivate such devices immediately when notified by the FCC or licensee who may be experiencing interference.

I. COMMISSION SHOULD DENY KATHREIN'S REQUEST FOR WAIVER OF FCC CONSUMER BOOSTER ANTI-OSCILLATION RULES

The Commission should deny Kathrein's request for waiver of the FCC's consumer booster anti-oscillation rules pursuant to rule parts 20.21(e)(5) and 20.21(e)(8)(ii)(A).[7] Kathrein requests a waiver of the FCC anti-oscillation rules because their proposed consumer booster, which they refer to as a compensator device,[8] is designed to be oscillation proof and is consistent with the intent of the rule.[9] Kathrein does not offer any reason that it cannot comply with the FCC's anti-oscillation rules and the National Protection Standard, nor does Kathrein suffer any harm or burden by making its consumer booster compliant with the FCC's anti-oscillation rules. In addition, Kathrein's waiver request contains significant technical flaws in its analysis of the

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[7] § 20.21 (e)(5) Anti-oscillation. Consumer Signal Boosters must be able to detect and mitigate any unintended oscillations in uplink and downlink bands (such as may result from insufficient isolation between the antennas), and § 20.21(e)(8)(ii)(A) Anti-Oscillation. Consumer boosters must be able to detect and mitigate (i.e., by automatic gain reduction or shut down), any oscillations in uplink and downlink bands. Oscillation detection and mitigation must occur automatically within 0.3 seconds in the uplink band and within 1 second in the downlink band. In cases where oscillation is detected, the booster must continue mitigation for at least one minute before restarting. After five such restarts, the booster must not resume operation until manually reset.

[8] Kathrein has named and refers to its consumer booster device as a compensator. It is seeking to certify and distribute its device as a consumer booster.

[9] Kathrein Wavier Request, section 1.A Waiver of Anti-Oscillation Rule, pages 6-9. Additional information is provided in its Attachment B – Link Budget.

potential for signal booster oscillation. As a result of these technical flaws, Kathrein's conclusions are flawed and incorrect. Thus, their waiver request of the Commission's anti-oscillation rules should be denied.

The FCC's anti-oscillation rule is a critical component of the Commission's Consumer Signal Booster Network Protection Standard (NPS) in its Part 20 rules.[10] This is a strict requirement of the FCC rules and the NPS, and is required to prevent harmful interference to CMRS licensees' networks and their customers. Consumer booster operation is authorized on a secondary non-interference basis in licensed CMRS spectrum.[11] Furthermore, consumer booster oscillation has been a long standing and significant cause of harmful interference to CMRS networks over the years. Prior to the implementation of the Commission's anti-oscillation rules, there were an exhaustive number of documented cases of interference. Each case required extensive engineering resources to troubleshoot, detect and resolve, thus causing significant harm to CMRS licensees. In addition, the interference creates an additional regulatory burden for the FCC because it must investigate and resolve these issue (i.e. cease and desist orders). For these reasons the anti-oscillation requirements were included in the Consolidated Proposal for new consumer signal boosters, which was submitted by industry consensus including booster manufacturers and the CMRS industry, and consequently adopted into the Commission's rules and the NPS, which are required to prevent harmful interference to CMRS licensees.

In addition, mobile consumer boosters are not stationary and can be located very close to nearby base stations and other users, causing harmful interference on uplink and downlink

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[10] 47 C.F.R. § 20.21(e).

[11] 47 C.F.R. § 20.21(d).

spectrum bands. When causing interference, these mobile interference sources are extremely difficult to detect within the network. Further, Kathrein's proposed booster device is a wideband consumer booster, which amplifies all the CMRS spectrum blocks in the supported bands of operation, and when interference is caused due to oscillation, the harmful interference is caused not just to the customer's serving CMRS licensee's spectrum, network and customers, but also to the other licensee's adjacent spectrum blocks, network and customers due to its wideband booster amplifier characteristics. It is extremely important for these mobile wideband consumer boosters to have anti-oscillation capabilities to protect CMRS networks from interference.

Per its waiver request, Kathrein is seeking equipment certification and proposes to manufacture, market and distribute a mobile wideband consumer signal booster to the automotive industry, and seeks a waiver from the FCC so it does not need to include the anti-oscillation capabilities in the consumer booster, which is required by FCC rules and the NPS. This consumer booster type is defined under FCC rules as a wideband mobile consumer booster. In addition, it is classified as a wideband mobile consumer booster that uses direct contact coupling as the server antenna (cradle-type booster antenna, inside the vehicle), which is limited to 23 dB maximum gain under FCC rules. This wideband mobile cradle-type consumer booster is similar to the mobile consumer boosters on the market today that fully meet the FCC's anti-oscillation rules. Kathrein should be held to the same standard. There are no valid reasons Kathrein cannot similarly comply with the Commission's anti-oscillation rules, as are required of all manufacturers of consumer boosters for fixed and mobile types.

Kathrein claims its wideband mobile consumer booster device is "Unlike conventional consumer signal boosters, the compensator and accessories will be professionally installed in

fixed locations in the vehicle during the automobile manufacturing process."[12] However, Kathrein's device is not unlike conventional consumer boosters, as these mobile consumer boosters devices are often installed by third party automotive shops with professional installers. This is usual and standard practice in the mobile consumer booster industry. Kathrein's use of professional installers does not differentiate them from other conventional boosters. The only difference is the consumer booster installation occurs at the manufacturer rather than at an aftermarket dealer or third party installation facility. In any event, both cases must fully comply with FCC rules for all interference protections in the National Protection Standard. Kathrein should also comply. Using professional installation and/or a particular consumer booster design does not justify non-compliance with a critical component in the Commission's rules and the NPS.

Kathrein adds that its wideband mobile consumer booster device will support up to 5 frequency bands, [13] appears to the network as a mobile phone without vehicle shielding, and supports an antenna checking function on the external donor antenna. Kathrein claims "if a consumer attempts to modify any portion of this system, such as changing the external donor antenna, the booster will cease to function.[14] However, Kathrein admits that consumers are able to access the inside antenna, which is currently a cradle-type antenna.[15] This accessibility

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[12] Kathrein Wavier Request, Page 2.

[13] Id.

[14] Kathrein Wavier Request, Page 4, "The external [donor] antenna, RF connectors, and power supply will be "keyed," meaning that the device will function only when properly installed and receiving the intended control check signals. If a consumer attempts to modify any portion of this system, such as changing the external antenna, the compensator will cease to function"

[15] Kathrein Wavier Request, Page 2, "the cradle will be accessible by the consumer".

presents the opportunity for a consumer to "modify a portion of the booster system" which is the inside antenna, and causing unintended booster oscillations and harmful interference to CMRS licensees due to insufficient antenna isolation. Kathrein would not be able to control such modification by the end user.

The Kathrein Waiver Request further claims its consumer booster contains an "antenna recognition system for the external antenna that assesses the DC resistance and will shut down if it determines that the antenna type is not properly-installed and recognized," and will not operate should a consumer attempt to reuse the signal booster device in another car.[16] This recognition system appears to be using a relatively simple DC resistive technique on the external antenna, which can be easily defeated by a consumer.[17] This would offer no assurances that the booster would not be able to be removed and installed in another vehicle by consumers or a third party aftermarket professional automotive installation facility. In addition, the user can have the booster device and external antenna removed and relocated into a different vehicle, with the same or a different inside antenna, which would also be available to other users in other vehicles. The inclusion of an external antenna checking function does not justify a waiver of the Commission's anti-oscillation rules, and would not prevent the signal booster from causing harmful interference due to booster oscillations, due to the fact that Kathrein's design leaves the device susceptible to modification by the consumer.

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[16] Kathrein Wavier Request, Pages 4-5.

[17] For example, opening the antenna to inspect the components used or measuring the required resistance and/or impedance (i.e. on a standard off-the-shelf multi-meter) and installing the required components (i.e. resistors, etc.) on another coaxial based antenna system is a relatively easy task to replicate for some consumers and third party aftermarket professional automotive installation facilities. Additionally, this type of information is typically and can be readably posted on the world-wide web, and shared with others via a simple Google search.

Moreover, both the internal and external antennas can be moved to different locations on the vehicle. Just because the system may be able to detect which antenna is attached doesn't prevent the antenna from being relocated such that the isolation is reduced to the level that oscillations occur. For example, a booster's external antenna mounted to the roof of a vehicle may be an obstruction and relocated to the trunk lid. [18] This could be the case in taxis or police vehicles, for example.

The Kathrein Waiver Request also claims "In the case of the compensator [its consumer booster device] —unlike a conventional booster—the manufacturer has full control over each of these factors, and thus can reliably eliminate oscillation at the design stage," and thus "has no need for anti-oscillation mechanisms."[19] As described above, their consumer booster device can be easily modified by consumers and aftermarket third parties, and their antenna checking function is easily defeated.

In addition, during the life of the vehicle many parts are replaced. For example, a vehicle's body parts, interior parts, windows, etc. can be replaced due to typical fender benders, etc. The replacement parts are often aftermarket products and not original manufacturer parts. Thus, the manufacturer and Kathrein does not have any control over the configuration of the booster or parts used within the vehicle. Materials used in replacement parts may vary (i.e. plastic, fiberglass, glass, etc.). These changes in materials and configurations may have very different isolation properties and cause the booster to oscillate and interfere with CMRS networks.

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[18] In this case, the antennas may have line-of-sight signal propagation through the glass of the vehicle, minimizing the antenna isolation and causing booster oscillation.

[19] Kathrein Wavier Request, Page 8.

Furthermore, one needs to consider what will happen when the automobile experiences a collision. In the case where the vehicle is damaged in a collision, the isolation created by the body cannot be relied on. Body panels are damaged and may no longer be attached. Windows are shattered. The booster would begin to oscillate and create interference. This could prevent callers within the vehicle or others nearby from reaching 911. If the accident happens nearby a cell site, the interference could prevent all users from accessing the cell site. The interference can also impact E911 location technologies and prevent public safety officials from locating users in emergencies. Therefore, for these reasons, all consumer boosters are required to comply with the FCC's anti-oscillation rules and the NPS.

Kathrein also incorrectly mischaracterizes its booster's similarity to the FCC's direct connection signal booster type in its waiver request.[20] Per FCC rules and definitions for mobile consumer boosters, a direct connection signal booster must have a "physical connection" to the customer mobile phone device's RF antenna port, and be limited to a maximum gain of 15 dB. Again, Kathrein does not meet the standard for a FCC wavier because neither requirement is met by Kathrein's consumer booster that is a cradle-type mobile booster operating with up to 23 dB of gain.

In addition, Kathrein incorrectly quotes, mischaracterizes and misinterprets the Commission's anti-oscillation rules and requirements for direct connection signal boosters. Kathrein's waiver states that "the Office of Engineering and Technology ("OET") has determined that oscillation testing is not necessary" for direct connection consumer boosters, and "Consumer boosters certified as direct connection mobile boosters having less than or equal to

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[20] Kathrein Wavier Request, Page 8.

15 dB gain are exempt from compliance to testing procedures in sections 7.11.2 and 7.11.3," i.e., the two anti-oscillation testing procedures required for FCC certification."[21] These statements are patently incorrect. The correct quote from OET's KDB guidance for equipment certification is that direct connect mobile boosters are only "exempt from compliance to testing procedures in sections 7.11.3 and 7.11.4."[22] All consumer boosters, including direct connection consumer boosters, are required to comply with the FCC anti-oscillation rules, and to utilize the oscillation testing procedures pursuant to section 7.11.2 of OET's testing procedures guidance for equipment certification. Thus, all consumer boosters, including direct connection booster types, are required to have anti-oscillation capabilities that comply with the FCC's anti-oscillation rules. Kathrein is entirely incorrect in its assertions concerning direct connection consumer boosters, they have misinterpreted FCC rules and therefore their assumptions for the waiver request are invalid.

In addition to the reasons stated above, Kathrein's waiver request contain errors and significant technical flaws in its analysis of the potential for signal booster oscillation.[23] Therefore, its arguments lead to erroneous conclusions. In Attachment B of its waiver request, Kathrein describes its mobile consumer booster operating with booster gain up to 23 dB, with antenna gains of 5 dBi and 2 dBi, for a total system gain of 30 dB. It describes its cradle's coupling loss to a CMRS device is -7 dB, and it assumes the typical isolation between the external antenna and the inside cradle antenna would be 70 dB. Then, Kathrein's technical

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[21] Id., Pages 8-9.

[22] See OET's KDB 935210 D03 Signal Booster Measurements v03, dated June 5, 2015, Page 18.

[23] See technical analysis in Kathrein's waiver request and its Attachment B – Link Budget.

analysis of the potential for booster oscillation compares 70 dB to 23 dB. This technical analysis has errors and significant flaws for the following reasons:

1.) It compares the antenna isolation of the system to the incorrect booster system gain value, which uses incorrect reference points.[24] The values it is studying in its technical assessment are incorrect.

2.) It relies on a very high estimation for the isolation loss between antennas. It does not consider many other situations where the isolation loss is much lower and the booster is more likely to oscillate and cause interference to CMRS networks. We have measured and confirmed that very low antenna isolation values commonly exist in many mobile consumer booster antenna installations in a variety of conditions and environments. For example, as cars move they can be located in different environments (i.e. next to a bus, truck, pole or building, or in a garage), including opening doors when standing still, the antenna isolation, signal paths and reflections change dramatically, and when there is minimal antenna isolation due to these factors consumer signal boosters can oscillate and cause significant harmful interference to nearby base stations and mobiles.

3.) Signals can combine and increase the signal level received at the booster's antennas causing signal feedback and oscillation in consumer booster amplifiers. For example, due to multipath, 2 or 3 signals can combine and increase the signal level received by

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[24] The booster's system gain minus the cradle's coupling loss of -7 dB to devices (i.e. system gain of 23 dB) does not represent the booster's total system gain, which is 30 dB in this case. Kathrein's analysis has an error because it is inappropriately counting losses between antennas that do not exist. The cradle's coupling loss to the device is unrelated to the isolation loss between booster's donor and server antennas.

3 to 5 dB (i.e. above free space propagation) in this case. Signals also reflect off other nearby objects and can reduce antenna isolation occurring in many cases. This is the reason that signal level reflections and combinations must be taken into account in the booster oscillation analysis and a margin of operation must be maintained to prevent oscillations. Industry standards specify 15 to 20 dB margin for good performance and preventing signal booster oscillations to occur in practice. This margin must be included in the oscillation analysis of the booster gains and antenna isolations. When multiple signal paths and reflections occur, which dramatically change depending on the booster and vehicle's environment, these factors result in decreased isolation and increased signal feedback and oscillation levels that have the potential to cause harmful interference to CMRS licensee's networks. This doesn't even include such cases where consumers are intentionally using unauthorized higher gain antennas, or other scenarios such as attempting to connect boosters back to back for additional gain, which has been observed in the marketplace before, and would represent additional risks for the potential to cause booster oscillations and interference to CMRS networks.

For all of the reasons provided above, Kathrein's request for waiver of the FCC's consumer booster anti-oscillation rules should be denied. Just as all other manufacturers of mobile consumer boosters, Kathrein should be required to fully comply with all of the FCC's rules and the National Protection Standard.

In addition, pursuant to FCC's anti-oscillation rules, after five restarts of the booster detecting and mitigating oscillations, the booster must not resume operation until after it is

manually reset by the operator.[25] The Commission should clarify that all consumer boosters must be able to be manually reset by the operator. Kathrein's proposed consumer booster is not in compliance with this FCC anti-oscillation requirement, as its booster device is designed to be not accessible by consumers.

II. COMMISSION SHOULD PROVIDE A DETERMINATION FINDING KATHREIN'S PROPOSED CONSUMER BOOSTER DOES NOT PROVIDE EQUIVALENT PROTECTION AS THE FCC CONSUMER BOOSTER ANTI-OSCILLATION RULES

The Commission should provide a determination finding Kathrein's proposed consumer booster and installation does not provide "equivalent protection" pursuant to 20.21(e)(10) as compared to the FCC's consumer booster anti-oscillation rules pursuant to rule parts 20.21(e)(5) and 20.21(e)(8)(ii)(A). As provided in the previous section, Kathrein's proposed mobile wideband consumer booster is substantially similar to other mobile wideband consumer boosters, and its professional installation and unique design do not serve as an adequate substitute for the FCC's anti-oscillation rules and National Protection Standard for consumer signal boosters. There is no justification for granting of a waiver or equivalent protection status under the Commission rules when considering all factors.

It also should be noted that the wireless carrier licensees previously provided "blanket consent" for consumer boosters operating on their licensees provided that they fully comply with all of the Commission's rules and the NPS for consumer signal boosters. Consumer boosters that do not comply with the NPS and are provided with an "equivalent protection" determination from the Wireless Telecommunications Bureau may not enjoy the same consent status from the

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[25] 47 C.F.R. § 20.21(e)(8)(ii)(A).

licensee community. This also would not be in the public interest as it would create undue uncertainty for consumers, manufacturers and distributors in a marketplace that is embarking on a new regulatory framework.

III. COMMISSION SHOULD DENY KATHREIN'S REQUEST FOR WAIVER OF FCC CONSUMER BOOSTER LABELING RULES

The Commission should deny Kathrein's request for waiver of the FCC's consumer booster labeling rules pursuant to rule parts 20.21(f).[26] Kathrein requests a waiver of the FCC labeling rules because their proposed consumer booster packaging and device will not be

[26] § 20.21(f) Signal booster labeling requirements. Signal booster manufacturers, distributors, and retailers must ensure that all signal boosters marketed on or after March 1, 2014 include the following advisories: (i) In on-line, point-of-sale marketing materials, (ii) In any print or on-line owner's manual and installation instructions, **(iii) On the outside packaging of the device, and (iv) On a label affixed to the device**: (A) For Consumer Signal Boosters: (1) This is a CONSUMER device. BEFORE USE, you MUST REGISTER THIS DEVICE with your wireless provider and have your provider's consent. Most wireless providers consent to the use of signal boosters. Some providers may not consent to the use of this device on their network. If you are unsure, contact your provider. You MUST operate this device with approved antennas and cables as specified by the manufacturer. Antennas MUST be installed at least 20 cm (8 inches) from any person. You MUST cease operating this device immediately if requested by the FCC or a licensed wireless service provider. WARNING. E911 location information may not be provided or may be inaccurate for calls served by using this device. [emphasis added]

accessible to consumers,[27] and such labeling would not be "beneficial to the public interest".[28, 29] Kathrein does not offer any substantial reason, harm or burden that would be caused to any party by Kathrein's compliance with the FCC rule to place a label on the consumer booster packaging and device.

These FCC notices and advisory labels are important and necessary information for consumers, and others in the consumer booster device use, installation and distribution chain. For example, whether or not a mobile consumer booster is preinstalled in a vehicle by a distributor or installed by a third party aftermarket installation facility, and the customer does not have access to the packaging of the device, this FCC advisory information is still useful to distributors, installation facilities and installers as well. The reason being that important RF safety information regarding the installation of antennas that "MUST be installed at least 20 cm (8 inches) from any person" is useful information to the installation personnel. Also, the third party installation facility or dealership may assist in providing the required consumer booster registration for the customer.

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[27] Kathrein requests a waiver of § 20.21(f)(iii) and (iv) of FCC rules regarding labeling of the consumer booster packaging and device. This does not include § 20.21(f)(i) and (f)(ii) of FCC rules.

[28] Kathrein Wavier Request, section 1.B, pages 8-9. Kathrein "proposes that it provide an advisory notice to the automobile manufacturers, who would then ensure that the language is placed in all on-line, point of sale marketing materials and on print or on-line owner's manuals. As a condition of the waiver, Kathrein will bind automobile manufacturers by contract to ensure that their dealers provide this notice to the consumer. A sample consumer notice is attached. Kathrein requests a waiver of the requirements to place the advisory on the device packaging and on the device itself, as neither of these requirements would be beneficial to the public interest because consumers do not have access to the packaging or device."

[29] In its waiver request, Kathrein references one instance of a partial waiver granted to Audi AG for the Audi Phone Box. For this device that has not been built or certified, the Commission should consider retracting this partial waiver for reasons provided herein.

The FCC label must be affixed to all consumer booster devices, preinstalled or otherwise. These FCC labels are generally small and easily placed on all consumer booster mobile and fixed devices, and provide important information to current and future users. There is no harm or burden in complying with this important FCC labeling rule. Once in the marketplace, these devices are owned by consumers and they are free to have them removed (i.e. by third party automotive facilities, at a junk yard, or otherwise) and sell these consumer signal boosters and antennas to others. In this case, this important regulatory information is passed onto the next owner and operator of the consumer booster device.

We note that while we agree with Kathrein's proposal to provide the FCC advisory notice to the automobile manufacturers and require dealers by contract to ensure that they provide this FCC advisory notice to consumer as well,[30] we disagree that providing this information should be conditioned on the Commission's granting of a waiver. The Commission should clarify and require all distributors and installation facilities that install consumer signal boosters must pass along the required FCC advisory notice to consumers. A wavier to Kathrein is not necessary to ensure this, they should comply voluntarily as do other manufacturers in accordance with FCC rules.

The benefits of maintaining the FCC advisory labeling on the consumer booster packaging and device are in the public interest, and there is no reason for Kathrein not to comply with FCC labeling rules as do other industry manufacturers.

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[30] Kathrein Wavier Request, section 1.B, pages 8-9

IV. COMMISSION SHOULD PROVIDE A DETERMINATION FINDING KATHREIN'S PROPOSED CONSUMER BOOSTER INSTALLTION DOES NOT COMPLY WITH FCC INTERFERENCE MITIGATION RULES

The Commission should provide a declaratory ruling and/or determination finding Kathrein's proposed consumer booster installation does not comply with FCC interference mitigation rules. Pursuant to section 20.21(d) of FCC rules,[31] consumer boosters are required to operate on a non-interfering basis, and the ***operator*** of the signal booster must have the ability to ***deactivate*** the signal booster immediately when notified by the FCC or licensee experiencing interference.[32]

As outlined in the Kathrein Waiver Request, the preinstalled consumer booster will be completely inaccessible by the operator,[33] and the *operator* cannot deactivate the booster, even in cases when harmful interference is caused to a licensee, and even upon request from the FCC or affected licensee.

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[31] § 20.21(d) "Operation on a secondary, non-interference basis. Operation of signal boosters under this section is on a secondary, non-interference basis to primary services licensed for the frequency bands on which they transmit, and to primary services licensed for the adjacent frequency bands that might be affected by their transmissions.

(1) The operation of signal boosters must not cause harmful interference to the communications of any primary licensed service.

(2) Upon request of an FCC representative or a licensee experiencing harmful interference, **a signal booster operator must** (i) cooperate in determining the source of the interference and (ii) if necessary, **deactivate the signal booster immediately**, or as soon as practicable, if immediate deactivation is not possible." [emphasis added]

[32] We note this is not only a requirement in the FCC rules for consumer boosters, but this is also standard operating procedure and requirements for operators of all radio equipment authorized in FCC rules. In the event of harmful interference and upon notification from the FCC or affected licensee, the operator must be able to deactivate the equipment causing the interference.

[33] Kathrein Wavier Request, Page 9, "the compensator [signal booster] is installed in locations not accessible to consumers"; Pages 13-14 "the Kathrein device [signal booster], is installed within a vehicle during the manufacturing process and is not viewable or accessible by consumers"; Page 4 the signal booster "cannot be set up, modified, or even accessed by the consumer."

The Commission should make clear that this type of consumer signal booster design, implementation and installation is in fact a violation of its interference mitigation rules, and is not authorized for equipment certification or operation. As required by § 20.21(d), the operator of the consumer booster must be able to maintain positive control and deactivate the booster when it's causing harmful interference to a CMRS licensee.

In its waiver request, Kathrein describes a situation whereby the operator can coordinate with its vehicle's dealership to presumably schedule the next availability that is convenient for the operator to drive to the dealership and for the service department to deactivate the booster causing the interference.[34] This solution is inherently unreliable. There is no guarantee a consumer or the dealership would comply. This consumer booster equipment and operation is not in compliance with FCC rules, which requires the operator to be able to deactivate the booster immediately when it's causing interference. This approach of having the operator drive to the dealership when interference is occurring is simply flawed and does not work under many situations.[35]

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[34] Kathrein Wavier Request, Page 8, Footnote 17, "Should a consumer receive such a notice [from FCC or a licensee experiencing harmful interference] with regard to use of the Kathrein [consumer booster] device, they would be able to bring their automobile to the dealership to shut down the device."

[35] For example, in cases: 1.) the vehicle is out of town, person has moved, or is located too far from the dealership, 2.) the operator does not have time to drive to the dealership, i.e. has to drive to work, pick up kids, assist an elderly person, or must attend to other pressing issues, etc., 3.) the dealership is closed down, or taken over by another dealership or different business, 4.) it's after hours or on Sunday when the dealership is closed for service, and 5.) the dealership's service department are scheduled for other repairs and servicing other vehicles at the time. Also, turning off the vehicle's ignition is not a practical method either, as when the operator needs to drive to another destination the harmful interference would simply resume.

In its waiver request, Kathrein also states that "carriers may shut off service for customers who fail to do so,"[36] as a consequence of customers being unable to deactivate the signal booster device in cases of interference. It should be noted that harmful interference can be caused to licensees that are not providing service to the operator of the consumer booster, or have any control over such operators' devices. Consumer boosters can and have been shown to cause harmful interference, including oscillation interference, to CMRS licensees on all spectrum blocks within the pass band of the wideband consumer booster, and even in cases where there are no CMRS devices using the booster. Therefore, shutting off phone service would not prevent boosters from causing interference to CMRS networks. Kathrein fails to comply with FCC rules that require the *operator* to be able to deactivate their consumer booster devices to terminate interference occurring to any CMRS licensee.

Furthermore, to be in compliance with FCC rules, the consumer booster's operator must have the ability to access a practical means (i.e. mechanical or electrical switch) to immediately deactivate the consumer booster in cases when harmful interference is caused to a CMRS licensee. Kathrein's consumer booster device does not have this ability, nor would they afford their customers the ability to comply with this FCC requirement.

V. CONCLUSION

For the reasons stated above, the Commission should deny Kathrein's request for waiver of the FCC's anti-oscillation and labeling requirements as outlined in rule parts 20.21(e)(5), 20.21(e)(8)(ii)(A), and 20.21(f), and deny its request for a determination that grants equivalent protection status pursuant to 20.21(e)(10), for certification and marketing of its consumer

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[36] Kathrein Waiver Request, Page 8.

wideband signal boosters that do not comply with the Commission's rules or Network Protection Standard.

In addition, the Commission should provide a declaratory ruling and/or determination finding Kathrein's proposed consumer booster installation does not comply with section 20.21(d) of FCC rules requiring that consumer boosters maintain the ability for operators to deactivate them immediately when notified by the FCC or licensee experiencing interference.

Respectfully submitted,

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Dated: August 10, 2015