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SUMMARY

Metricom applauds the Commission's proposal to allocate 350 MHz of spectrum in the 5 GHz band for use of unlicensed devices. Metricom believes that unlicensed devices will provide a central role in offering efficient and effective wireless communications and NII access to schools, hospitals businesses and other users. Metricom is concerned, however, that the proposed technical standards for SUPERNet devices, including a complex spectrum etiquette, will not serve the public interest because the standards will severely limit the application of such devices and will not permit the longer-range communications networks required by our educational, health care and business communities for access to the NII. Accordingly, Metricom urges the Commission to modify the proposed technical requirements for SUPERNet devices to permit longer-range applications in the 5.8 GHz band.

Metricom also urges the Commission to allow higher-power SUPERNet devices to be utilized on an unlicensed basis. Under its present rules, the Commission already allows unlicensed operations at 1 watt plus antenna gain, and unlicensed operators in bands containing these devices operate successfully without causing harmful interference. Concerns regarding interference or authority should not, therefore, dictate licensing higher-power SUPERNet devices. Moreover, licensing SUPERNet devices would lessen their public benefit by making them more expensive and removing a great

efficiency advantage of unlicensed spectrum -- efficient spectrum utilization through sharing.

Finally, should the Commission decide to authorize both SUPERNet devices and non-SUPERNet Part 15 devices to share the 5.8 GHz band, such sharing should be on an equal basis, and traditional Part 15 band sharing rules should govern interference disputes. Under no circumstances should the Commission alter or impair the operations of non-SUPERNet Part 15 devices which have already demonstrated their ability to serve the public interest by providing cost-effective, wireless access to the NII through community and in-building networks.

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

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In the Matter of)
)
Amendment of the Commission's Rules to) ET Docket No. 96-102
Provide for Unlicensed NII SUPERNet) RM-8648
Operations in the 5 GHz Frequency Range) RM-8653
)

COMMENTS OF METRICOM, INC.

Metricom, Inc., ("Metricom"), pursuant to the provisions of Section 1.415 of the Commission's rules, by its attorneys, submits these Comments in the above-referenced proceeding. Metricom applauds the Commission for proposing to allocate 350 MHz of spectrum in the 5 GHz band for unlicensed devices and services because Metricom believes that unlicensed spectrum will play the central role in providing schools, libraries, health care providers and a myriad of other users with cost-effective, high-speed wireless communications capabilities including NII access. Metricom is concerned, however, that the proposed technical restrictions governing NII/SUPERNet ("SUPERNet") devices will permit the creation of only short-range, in-room devices which will be of little benefit to these users. Accordingly, Metricom urges the Commission to permit higher-power SUPERNet operations in the 5.8 GHz band. Metricom is also concerned that the SUPERNet devices will have difficulty coexisting with non-SUPERNet Part 15 devices which are already authorized in the 5.8 GHz band. Existing Part 15 devices in other bands are providing many of the applications which

the Commission desires to achieve for SUPERNet devices. Therefore, Part 15 operations at 5.8 GHz must not be impeded.

I. INTRODUCTION.

Founded in 1985, Metricom is a young rapidly growing, technologically innovative company based in Silicon Valley. Encouraged by Commission actions in various Part 15 proceedings, Metricom has become a pioneer in the development of state-of-the-art spread spectrum packet radio systems. Metricom has invested significant time and resources to develop, manufacture and market sophisticated RF devices which operate on an unlicensed basis pursuant to Part 15 of the Commission's rules. Operating at a gross over-the-air transmission rate of 100 kbps and actual user data rates of up to 28.8 kbps, Metricom's "Ricochet" service is the fastest, most easily deployed, and least expensive wide-area wireless data network available today.

Of particular relevance to this proceeding, Metricom is presently utilizing unlicensed wireless technology under Part 15 of the Commission's rules to provide schools, libraries, businesses and individuals with high-speed wireless access to the NII, school and corporate networks and on-line services. Metricom has constructed and deployed unlicensed, wireless data networks on a number of universities and corporate campuses across the U.S. Metricom is also currently providing high-speed, unlicensed data communications through its network to subscribers in the San Francisco Bay and Silicon Valley areas, and will provide similar

networks in Washington, D.C. and Seattle in the very near future.

As a current provider of unlicensed, wireless networks offering NII access, Metricom supports the Commission's goal of providing advanced wireless telecommunications services to educational institutions, health care providers, libraries, businesses and other users.^{1/} However, the technical specifications proposed in the NPRM will not allow the Commission to achieve this laudable goal.

To achieve the its goal, Metricom believes that the Commission's SUPERNet rules must provide for:

1. Effective Communication Within Buildings. To achieve the cost savings and technical benefits associated with wireless networks, SUPERNet signals must be able to travel within buildings, i.e., from room to room and floor to floor. Otherwise, the resulting networks will require wired network backbones to be installed between rooms and floors at a cost comparable to the installation of a fully wired network. Therefore, the ability of potential users to afford and benefit from SUPERNet devices will be greatly reduced if the signals do not have sufficient in-building penetration.

2. Effective Communication Within Communities. Schools, libraries, hospitals and businesses do not exist in a vacuum; they are essential members of a larger community; there is a need for

^{1/} In the Matter of Amendment of the Commission's Rules to Provide for Unlicensed NII SUPERNet Operations in the 5 GHz Frequency Range, Notice of Proposed Rulemaking, ET Dkt No. 96-102, ¶ 2 (released May 6, 1996) (the "NPRM").

communications between all members of the community from school, library, office and home. For example, administrators, teachers, students, and parents need to communicate with each other to enhance a child's education. Doctors, nurses, and patients need to communicate and to access important medical information. On college and university campuses, professors, students and librarians need to communicate from building to building, from various locations on campus and from residences and homes. Corporate campuses have similar needs. If they are to be truly useful and of benefit to the public at large, SUPERNet systems must allow for such "community-type" communication on a wireless basis. If they do not, the resulting network will require installation of an extensive wired infrastructure and will limit mobility, and, thus, will fail to realize the tremendous cost and technical benefits associated with unlicensed, wireless networks.

The Commission's stated objective is certainly laudable and promising. However, as demonstrated below, the technical requirements proposed by the NPRM will produce only short-range, in-room, wireless communication systems. Clearly, it is not in the public interest for the Commission to allocate valuable spectrum for the application of what will prove, without a doubt, to be an inadequate technology that will be of limited usefulness and even more limited public benefit.

Furthermore, it is not in the public interest for the Commission to harness SUPERNet devices with restrictive technical requirements, because SUPERNet devices will share the 5.8 GHz band

with other Part 15 devices which will operate at considerably higher radiated power using much less bandwidth. The SUPERNet devices will be low-power, high-bandwidth devices which will be very susceptible to interference from other Part 15 devices operating in the band. Under no circumstances should the Commission alter or impair the operations of non-SUPERNet Part 15 devices, including spread spectrum devices operating under Section 15.247; these devices have already demonstrated the ability to provide the cost-effective, wireless community and in-building networks offering NII access that serve the public interest.

II. THE NPRM PROPOSES THE USE OF WIDEBAND, LOW-POWER, SHORT RANGE SYSTEMS THAT WILL PROVIDE LITTLE PUBLIC BENEFIT.

A. The proposed spectral density and interim etiquette rules effectively mandate that SUPERNet devices operate at high bandwidths.

The Commission proposes a spectral power density limit of 0.03 milliwatts per 3 kHz of bandwidth.^{2/} To achieve optimum range, nearly all systems will utilize the maximum permitted EIRP of 0.1 watt. However, to operate at the maximum proposed power level, SUPERNet devices would need to radiate signals with a minimum 10 MHz bandwidth. (Indeed, if the Commission were to adopt a 1.0 watt maximum power limit on SUPERNet devices, the power density requirement limit would force the system to be 100 MHz wide.)

The Commission also proposes a "listen-before-talk" interim etiquette standard which permits higher bandwidth systems to wait less time than lower bandwidth systems before resuming monitoring

^{2/} NPRM, Appendix A, Proposed Rule 15.407 (a).

and transmitting functions. Under the proposed interim standard, the monitoring system bandwidth must be equal to or greater than the emission bandwidth of the intended transmission and must have a maximum reaction time less than $50 \times \text{SQRT}(12.5/\text{emission bandwidth in MHz})$ microseconds for signals at the applicable threshold level.^{3/} Under this proposed standard, SUPERNet devices radiating signals at less than 12.5 MHz bandwidth are, in effect, penalized, and must wait longer before resuming monitoring and transmitting functions.

Therefore, in order to operate at maximum permitted EIRP and obtain maximum operating efficiency under the proposed "listen-before-talk" protocol, systems will be forced to operate using bandwidths in excess of 12.5 MHz bandwidth.

B. The high-bandwidth SUPERNet devices will have limited range due to decreased receiver sensitivity, low power limits and propagation losses at 5.8 GHz.

As demonstrated above, the proposed power density and interim etiquette rules strongly encourage SUPERNet devices to radiate wideband signals. Wideband receivers will be necessary to receive the signals emanating from the wideband transmitters, and this will negatively impact the range of SUPERNet devices because receiver sensitivity is inversely proportional to receiver bandwidth.

Also hampering the range of SUPERNet systems are the proposed power limits. In the NPRM, the Commission proposes to limit the power of SUPERNet devices to 0.1 watt maximum EIRP, a dramatic

^{3/} NPRM, Appendix A, Proposed rule 15.411(a)(5).

reduction as compared to Part 15, spread spectrum power levels.^{4/} Even in the 915 MHz band, which has considerably greater propagation characteristics than the 5.8 GHz band, Part 15 devices may operate at 1.0 watt plus 6 dBi antenna gain. Curiously, the Commission has decided to severely lessen the permitted power of unlicensed SUPERNet devices even though such devices must operate in a higher frequency range with considerably worse propagation characteristics. As a result, such devices will be severely range constrained. Assuming building losses of 15 dB and a loss exponent of 2.8,^{5/} the range for a SUPERNet device operating at 0.1 watt over 10 MHz of bandwidth in the 5.8 GHz band will be only 20.4 feet.

C. Short-range, in-room SUPERNet devices will provide little public benefit.

Operating with an approximate range of 20.4 feet, SUPERNet devices can only be considered effective "in-room." Thus, as proposed, SUPERNet networks can be used for only one purpose: to place a fixed, wired transceiver in a given room and to allow mobile, wireless transceivers within that room to receive and transmit signals to and from the fixed transceiver. The proposed technical restrictions will simply not allow any other configuration. By restricting SUPERNet systems to one very short-

^{4/} 47 C.F.R. § 15.247(b).

^{5/} In Metricom's experience, building penetration losses generally range from 10 dB to 20 dB and loss exponents generally range from 2.0 to 4.0. For this equation, Metricom chose 15 dB because it is an average building penetration, and 2.8 because it represents the loss exponent for a typical suburban community.

range application, the Commission is dramatically limiting the public benefit of SUPERNet systems. By proposing a configuration which will require extensive wired network backbones, the Commission is severely restricting the ability of communities centered around schools, health care providers and other users to benefit from SUPERNet systems.

Clearly, schools, hospitals and businesses are all individual communities unto themselves and are each significant components of larger communities. For example, an elementary school teacher in one room will need to communicate with a teacher, student or librarian in a different room, in a different building, or from across town. Students will require access to the school library computer from their homes; parents will need to communicate with teachers and school administrators; and schools within a district will need to communicate with each other and their administrative offices. Similarly a doctor tending to a patient will need to communicate with other doctors, nurses, and research databases located throughout a health care facility and, likely, in different buildings. In school, health care and business communities, high-speed research and communications capabilities are becoming increasingly important as members of these communities require high-speed NII access from both central and remote locations.

SUPERNet networks will be able to provide such inter-room, inter-building and inter-community communications and NII access but only via hardwired support infrastructures. This destroys the promise of high-speed, cost-effective, wireless communications.

The most cost-effective way to connect schools, libraries, health care providers, and other users is through unlicensed, wireless communications. But the SUPERNet proposal will mandate the precise opposite. It will require users to wire each building and each room to gain wireless connection within a room. Such networks will be priced out of reach for most of the users which the Commission professes to want to assist.

III. THE PROPOSED POWER LIMITS ARE OVERLY RESTRICTIVE BECAUSE THEY WILL LIMIT THE UTILITY OF SUPERNET SYSTEMS AND ARE UNNECESSARY TO PREVENT INTERFERENCE TO OTHER LICENSED AND UNLICENSED DEVICES IN THE SUPERNET BANDS.

Spread spectrum unlicensed products and services have thrived in the 915 MHz band operating at a maximum permitted power of 1.0 watts plus 6 dBi antenna gain as permitted under Section 15.247. For example, operating at this level, Metricom is successfully providing unlicensed wireless community networks and NII access to schools, universities and corporate campuses throughout the U.S. However, if 1.0 watts plus 6 dBi antenna gain is required to successfully operate a community network at 915 MHz, then significantly greater power would be required to operate a community network in the 5 GHz range due to the poorer propagation characteristics in the higher band.

Curiously, the Commission has proposed a maximum EIRP level of 0.1 watt for SUPERNet devices in the 5 GHz range, and has stated that such a limit is necessary to prevent harmful interference to other licensed and unlicensed services. However, as demonstrated below, (i) the Commission's concern for harmful interference to

other unlicensed devices is unfounded and is premised upon incorrect assumptions regarding the ability of unlicensed devices to adapt and react to interference; and (ii) the Commission's concern regarding interference to licensed devices is misplaced due to the unfriendly propagation characteristics in the 5 GHz band.

A. The Commission's perception of "harmful interference" for unlicensed operations is outdated and inaccurate.

The Commission has generally premised its regulation of radio-based systems on the theory that such systems are susceptible to harmful interference from other radio signals, and its rules, therefore, have sought to protect each system from the signals of other systems. This theory was premised on guaranteeing a certain level of service to the public. Such an approach continues to be sound for licensed services. However, it is not sound for regulating unlicensed devices and services because unlicensed devices seek only the opportunity to provide service - not a guaranteed level of service. The advent and wide proliferation of interference adaptive technologies in the unlicensed bands makes stringent operating limits designed to prevent interference between unlicensed systems unnecessary. Unlicensed systems are now designed to operate in heavily congested environments where systems designers expect and plan for interference. For example, one method that spread spectrum systems can use to avoid interference on a given channel is to move to another channel within a wide band of allotted frequencies.

Instead of imposing stringent limitations on systems' power levels in order to prevent harmful interference, the Commission should view interference as an inevitable occurrence in unlicensed bands, and it should permit systems engineers, using available technologies, to design systems that can effectively adapt and react to interference. As noted above, under traditional regulatory paradigms, FCC rules were designed to prevent interference at the radio or physical layer. However, the successful utilization of advanced technologies makes it possible to expect interference and adaptively deal with it. This is presently being done by unlicensed devices and services that utilize intelligent software algorithms, digital coding techniques and spread spectrum technology to adapt and react effectively to interference. Such operations render interfering signals "non-harmful." These new technologies make the use of severely restrictive power limits obsolete and unduly limiting. Power limits such as those in Section 15.247 that recognize the ability of unlicensed devices to avoid interference will permit greater and more useful applications of unlicensed products and services in the 5.8 GHz band as they have done in the 915 MHz band.

- B. The propagation characteristics of the 5.8 GHz band make the proposed power limitations unnecessary in order to avoid interference to other licensed and unlicensed devices.

Though certain licensed services presently operate in the proposed SUPERNET bands, the propagation losses in this frequency

range make it highly unlikely that unlicensed devices will cause harmful interference to licensed services in the bands.

Another reason unlicensed devices will not cause harmful interference to licensed devices is that licensed services may operate at sufficiently high power levels. For example, amateur devices in the 5.8 GHz band may utilize up to 1500 watts.^{6/} Operating at this levels, the amateur service will have sufficient power to overcome the noise generated by unlicensed SUPERNet devices. Therefore, licensed services will not be adversely affected by SUPERNet devices in the 5.8 GHz band, even if the SUPERNet devices operate at power levels higher than those proposed in the NPRM.

IV. A COMPLEX SPECTRUM ETIQUETTE WILL SIGNIFICANTLY CONSTRAIN THE DEVELOPMENT OF PRODUCTS IN THE BAND AND WILL NOT SUCCESSFULLY PREVENT INTERFERENCE.

According to the NPRM, the Commission seeks to: (i) "permit significant flexibility in the design and operation of these [SUPERNet] devices";^{7/} and (ii) "provide opportunity for the greatest variety of unlicensed devices that may use these bands."^{8/} However, by proposing the adoption of a spectrum etiquette,^{9/} the Commission will effectively mandate one type of design, one type of

^{6/} 47 C.F.R. § 97.313

^{7/} NPRM at ¶ 1.

^{8/} NPRM at ¶ 46.

^{9/} NPRM at ¶ 52.

operation, and will foreclose any opportunity to create a variety of unlicensed devices and applications.

Metricom has consistently argued that there should be no spectrum etiquette in unlicensed bands; rather, the Commission should adopt only very minimal and flexible technical standards just as it did when it adopted the Section 15.247 rules. Metricom firmly believes that flexibility will promote and assure the most efficient and effective use of the SUPERNet bands. Flexible technical regulations, encouraging the deployment of new and innovative technologies, are especially important in the SUPERNet bands because of the enormous potential to supply essential, wireless networks and NII access to schools, hospitals and other users that otherwise could not afford such capabilities. No one can predict the technology or applications which will be developed for the band. However, it can be predicted with certainty that lengthy, complex and restrictive technical specifications will stifle innovation and development and provide less public benefit from SUPERNet applications. Specifying a particular technical standard that will satisfy the requirements of every situation is not possible because it is not possible to anticipate all of the potential technology that will be employed, or the potentially great variety of SUPERNet uses.

Furthermore, because of the impossibility of predicting the uses and applications of future unlicensed operations, the Commission must continue to encourage unlicensed systems to be adaptive. Imposing complex and lengthy technical standards for the

operation of unlicensed transceivers, however, is counter to such an adaptive approach and is counter to the proven and successful approach of traditional Part 15 regulation. In order to encourage the deployment systems that utilize intelligent and adaptive technologies, the Commission should specify only the absolute minimum technical standards. Metricom believes that such an approach will allow operators and manufacturers to exercise their innovation and create intelligent and adaptive radios that can efficiently share unlicensed spectrum.

Exacting technical specificity is counter to the Commission's history of encouraging novel uses of unlicensed products and services, is counter to the efficient and effective use of the spectrum and is counter to the Commission's experience. Compare the simplicity of Sections 15.247 and 15.249 and the proliferation of products and services under these rules with the complexity of the etiquette required by the rules governing unlicensed PCS. The Commission's sole attempt to create and enforce a complex etiquette in an unlicensed band has resulted in a tremendously burdensome set of draft rules which remains unfinished to this date and has spawned little innovation. The Commission knows from experience that simple rules in the unlicensed bands inspire innovation and the creation of products and services which serve the public interest.

While, in theory, an etiquette may appear to allow for sharing of the spectrum, there is no practical evidence that complex etiquettes prevent interference. In reality, at best, etiquettes

have worked only on the white boards inside engineers' offices. At worst, complex etiquettes have stifled innovation and the creation of products and services which benefit the public.

Finally, an etiquette is not necessary to allow for efficient sharing among unlicensed users because unlicensed devices are now developed to react and adapt to interference. As noted in Section III above, today's unlicensed radios are intelligent radios. They are designed to anticipate and avoid interference. Techniques have been developed and are being used by unlicensed devices to work through the "interference environment" in which the Commission has always required unlicensed devices to operate. The level of success achieved depends upon the techniques used, as well as the performance required, by a particular application. The market, rather than the Commission or an etiquette, has always been and will continue to be the best arbiter of which technology or application will succeed.

V. THE COMMISSION SHOULD NOT LICENSE SUPERNET DEVICES IN THE 5.8 GHZ BAND.

The Commission asks whether, if it allows higher-power SUPERNet operations in the 5.8 GHz band, it should then license the SUPERNet devices in that band and, perhaps, assign the licenses by competitive bidding.^{10/} As noted above, Metricom believes that the Commission should allow SUPERNet devices to operate at higher power levels than those proposed in the NPRM. However, Metricom

^{10/} NPRM at ¶ 56.

strongly urges the Commission not to license the higher-power SUPERNet devices.

As an initial matter, Metricom questions why the Commission has even raised this issue, as if it is not consistent with Commission precedent to permit unlicensed operations at power levels higher than those proposed in the NPRM. As the Commission is well aware, unlicensed devices operating under Section 15.247 in the 5.8 GHz band are already allowed to operate at 1 watt plus 6 dBi antenna gain, and the recently proposed higher EIRP levels will allow certain spread spectrum devices in the band to operate at 1 watt with unlimited antenna gain.^{11/} Clearly, this cannot be a question of statutory authority because the Commission has already concluded that it has the authority to allow unlicensed devices to operate at a power level of at least one watt plus unlimited antenna gain. And it cannot be a question of interference because the Commission has already concluded that unlicensed devices operating at 1 watt plus antenna gain will not cause harmful interference in the band. Therefore, it would be absolutely consistent with Commission precedent if the Commission allowed SUPERNet devices to operate in the 5.8 GHz band at higher-power levels on an unlicensed basis.

Furthermore, licensing implies a property right which runs contrary to one of the primary benefits of unlicensed spectrum -- efficient spectrum use through sharing. Several unlicensed

^{11/} In the Matter of Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitter, Notice of Proposed Rulemaking, ET Dkt No. 96-8.

providers can share all of a single band, thereby increasing the public benefit from unlicensed spectrum. To create a property right in the 5.8 GHz band would dramatically reduce the number of users in the band, thus reducing the public benefit.

Finally, licensing the SUPERNet band, especially through competitive bidding, would defeat the purpose of unlicensed community networks; cost-effective, affordable wireless applications including NII access. Providers of unlicensed services can deploy wireless networks in schools, hospitals and elsewhere at affordable prices precisely because they do not need to pay for the right to use the spectrum and the myriad of other costs associated with obtaining and maintaining licenses. The Commission recently received testimony from educators that only unlicensed devices will provide the community-type networks that the education community needs, at prices that it can afford.^{12/} In contrast, licensing the SUPERNet band would produce a wireless service accessible only to those communities with substantial resources. This cannot be consistent with the Commission's vision for the SUPERNet bands.

VI. IT IS NOT IN THE PUBLIC INTEREST FOR THE COMMISSION TO IMPOSE THE PROPOSED TECHNICAL REQUIREMENTS ON SUPERNET DEVICES BECAUSE THEY WILL HAVE TO SHARE THE BAND WITH UNLICENSED DEVICES THAT ARE NOT SUBJECT TO THE SAME RESTRICTIONS.

The 5.8 GHz band is already allocated for use by several types of Part 15 devices including spread spectrum devices operating in

^{12/} FCC Staff Report By The Wireless Telecommunications Bureau, Summary of Policy Recommendations From "Using Wireless Technologies To Connect Our Schools," J.O. Wilson Elementary School, Washington, D.C., May 21, 1996.

accordance with Section 15.247 of the Commission's rules. Spread spectrum devices in the 5.8 GHz band may operate at 1 watt plus 6 dBi permitted power under Section 15.247. In addition, the Commission has proposed to amend Section 15.247 to allow certain spread spectrum devices in the 5.8 GHz band to operate with unlimited antenna gain.^{13/} Though, at present, there are not as many Part 15 devices operating in the 5.8 GHz band as there are operating in other Part 15 bands, more Part 15 devices will be deployed in the band as equipment designed for the band becomes more available.

The proposed technical restrictions on SUPERNet devices will damage the ability of such devices to share the band with other Part 15 devices that are or will be in the band. At best, SUPERNet devices will operate at less than one-tenth the power of non-SUPERNet Part 15 devices, and SUPERNet devices will have wideband receivers which will be very susceptible to interference from other Part 15 devices. Should the signals from SUPERNet devices collide with the significantly higher-power, narrower-band non-SUPERNet Part 15 devices, the result will almost certainly be harmful interference to the SUPERNet signals.

To avoid this problem, the Commission should restate the technical specifications for SUPERNet devices to allow operations at greater power and to allow narrowband signals. SUPERNet devices operating with greater power and radiating narrowband signals will

^{13/} See Note 12.

have greater ability to effectively share the band with non-SUPERNet Part 15 operations.

VII. SHOULD THE COMMISSION ULTIMATELY ADOPT THE SUPERNET RULES AS PROPOSED FOR THE 5.8 GHZ BAND, IT MUST NOT ALTER OR IMPAIR THE OPERATION OF NON-SUPERNET PART 15 DEVICES IN THE BAND.

As noted above, under the proposed plan, the SUPERNet band, though grand in design, will result in devices and systems that perform very limited functions and provide little public benefit. It is not debatable that SUPERNet devices, as proposed, will only provide short-range in-room communications services, and will not provide the longer-range wireless capabilities needed to connect, and provide affordable NII access to, America's school, hospital and business communities. For the reasons stated above, Metricom believes that the allocation of the frequencies in question for this limited function represents a gross waste of valuable spectrum, and a lost opportunity to provide increasingly important communications capabilities to our educational, health care and business communities.

Metricom asked the Commission to propose higher-power, longer-range devices that could provide true wireless community networks and NII access.^{14/} The educational community and other users are experiencing great success in utilizing higher-power unlicensed

^{14/} Comments of Metricom, Inc., In the Matter of Allocation of Spectrum in the 5 GHz Band to Establish a Wireless Component of the National Information Infrastructure, Petition For Rulemaking, RM No. 8653.

devices, and Metricom had hoped that SUPERNet would follow this tested and proven model. Therefore, Metricom continues to hope that the Commission will reconsider its decision to promote only short-range in-room communications in the SUPERNet band, and will adopt final rules that permit wireless, community-type networks that feature NII access.

However, if the Commission adopts the SUPERNet rules as proposed, and if the SUPERNet and non-SUPERNet Part 15 devices prove unable to effectively share the 5.8 GHz band, the Commission should permit traditional Part 15 rules to resolve the interference issues. Under no circumstances should the Commission alter or otherwise impair the operation non-SUPERNet unlicensed devices in the 5.8 GHz band. Individuals, the educational community and several universities and corporations have benefitted significantly from traditional unlicensed devices and services operating in accordance with Part 15 of the Commission's rules because such rules mandate only minimal technical requirements and allow providers significant flexibility to design wireless systems. For example, in contrast to the SUPERNet rules, Section 15.247 governing spread spectrum operations allows users to utilize the appropriate power levels, enabling the longer-range networks that they need.

Moreover, the operating rules under Section 15.247 have provided the flexibility necessary to develop appropriate technologies without the constraining limits of overly narrow