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October 25, 1999

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HAND DELIVERED

Ms. Magalie Salas, Secretary
Federal Communications Commission
445 12th Street SW, Room TW-B204
Washington DC 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Re: WT Docket No. 97-12
Amendment of the Amateur Service Rules to
Provide for Greater Use of Spread Spectrum
Communications Technologies

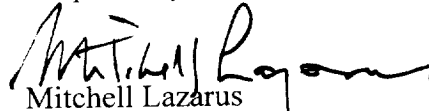
Dear Ms. Salas:

Enclosed are the original and nine copies of the Petition for Partial Reconsideration of Clearwire Technologies, Inc., for filing in the above-referenced docket.

Kindly date stamp and return the enclosed extra copy of the Petition.

If further information is necessary, please call me at the number above.

Respectfully submitted,



Mitchell Lazarus
Counsel for Clearwire Technologies, Inc.

ML:deb

Enclosures

cc: Thomas F. Daley, Esquire, Clearwire Technologies, Inc.
Mr. David C. Chauncey, Clearwire Technologies, Inc.
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Before the
Federal Communications Commission
Washington DC 20554

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter of)
)
Amendment of the Amateur Service Rules)
to Provide for Greater Use of Spread)
Spectrum Communication Technologies)

WT Docket No. 97-12
RM-8737

**PETITION FOR PARTIAL RECONSIDERATION OF
CLEARWIRE TECHNOLOGIES, INC.**

Mitchell Lazarus
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October 25, 1999

Counsel for Clearwire Technologies, Inc.

Before the
Federal Communications Commission
Washington DC 20554

In the Matter of)
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Amendment of the Amateur Service Rules)
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Spectrum Communication Technologies)

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

**PETITION FOR PARTIAL RECONSIDERATION OF
CLEARWIRE TECHNOLOGIES, INC.**

Pursuant to Section 1.429(a) of the Commission's Rules, Clearwire Technologies, Inc. (Clearwire) hereby petitions for partial consideration of the Report and Order in the above-captioned proceeding.¹

A. Summary

Clearwire provides high-speed wireless Internet and other network access using unlicensed spread spectrum technology in the 2.4 GHz band. Part of this band is shared with the Amateur Radio Service.²

The Report and Order liberalizes Amateur spread spectrum operations, including those in the 2.4 GHz band. Clearwire supports the substantive elements of the Report and Order. Specifically, Clearwire supports giving Amateur Radio licensees more flexibility in spread spectrum modulations; permitting amateur licensees to use power up to 100 watts, if necessary to accomplish a communication; eliminating record-keeping requirements; and eliminating the

¹ Amendment of the Amateur Service Rules to Provide for Greater Use of Spread Spectrum Communication Technologies, WT Docket No. 97-12, Report and Order, FCC 99-234 (released Sept. 3, 1999) (Report and Order), 64 Fed. Reg. 51471 (Sept. 23, 1999).

² Commercial spread spectrum operations are authorized at 2400-2483.5 MHz. 47 C.F.R. § 15.247. The 13 cm Amateur band runs from 2390-2450 MHz. 47 C.F.R. § 97.301(a).

requirement to transmit a station ID that can be received on a narrowband channel or with non-spread-spectrum equipment. Moreover, Clearwire does not seek any change in the relationship between Part 15 and the Amateur Radio Service. Clearwire acknowledges that it must accept interference from, and may not cause interference to, a lawfully operating Amateur station.³

Clearwire does, however, request two provisions to facilitate enforcement of the Amateur rules in the bands shared with commercial spread spectrum. First, Clearwire proposes that Amateur spread spectrum transmitters capable of operation at powers over 1 watt be certificated for compliance, particularly with regard to automatic power control under Section 97.311(d). Second, Clearwire is concerned that the elimination of Section 97.119(b)(5) may authorize Amateur licensees to transmit station IDs that are difficult to detect and decode.⁴ If additional information or algorithms are needed to read the station ID (as, for example, if this data is carried in the spread spectrum signal), then the manufacturer should be required to maintain instructions for decoding the station ID on a publicly accessible Internet site identified in the certification application. To facilitate station identification, Clearwire requests that Amateur spread spectrum equipment transmit both a call sign and the telephone number of the station location or remote control point. Clearwire supports exemptions from all of these requirements, however, for

³ 47 C.F.R. § 15.5(b).

⁴ Former Section 97.119(b)(5) section provided: "The call sign must be transmitted with an emission authorized for the transmitting channel in one of the following ways: . . . (5) By a CW or phone emission during SS emission transmission on a narrow bandwidth frequency segment. Alternatively, by the changing of one or more parameters of the emission so that a conventional CW or phone emission receiver can be used to determine the station call sign." 47 C.F.R. § 97.119(b)(5).

equipment constructed or modified by the Amateur licensee who operates it, or constructed or modified in small quantities by another Amateur licensee.

Clearwire acknowledges that Amateur spread spectrum operations have not yet become widespread, and that commercial equipment for this purpose is not yet being widely marketed. In view of the exemptions proposed above, present operations may be unaffected by this request. But Clearwire believes that Amateur spread spectrum operations will become more commonplace, and that a market for commercial equipment will develop. To petition for a new rulemaking at that time would initiate a period of at least two years, and possibly longer, before rules could take effect, during which Part 15 users would be vulnerable to unlawfully operating Amateur equipment. A grant of this petition will protect those users, without impeding either current operations or future innovations by licensees.

B. Commercial Spread Spectrum Operations at 2.4 GHz Are in the Public Interest.

The docket in this proceeding closed more than two years ago.⁵ Since then the commercial spread spectrum industry has swelled to well over a *billion* dollars. The same two years have also seen an important innovation in how the 2.4 GHz band is used: several companies have begun providing fixed broadband access to the Internet over considerable distances using spread spectrum technology.

Clearwire is one of those companies. It both manufactures equipment for 2.4 GHz wireless access to the Internet and other networks, and sells the service to Internet service

⁵ Comments and replies were due on May 5 and June 5, 1997. Amendment of the Amateur Service Rules to Provide for Greater Use of Spread Spectrum Communication Technologies, 2 FCC Rcd 2591 (released March 3, 1997).

providers and other network providers for resale to end users.⁶ The Clearwire system transmits Internet protocol (TCP/IP) over an Ethernet interface, over distances ranging up to 25 miles (40 km), using a point-to-point configuration in which one base station serves 50-200 end users. The transmitters are certified at 190 milliwatts, well under the permitted one-watt maximum. Antenna gains vary from zero to 17 dBi — also well under the permitted maximum at this power level. Service is nonetheless extremely reliable.

A Clearwire end user can transmit and receive simultaneously at symmetrical preselected speeds ranging from 128 to 640 Kbps. The service was first offered commercially in April 1999 in the Dallas TX and Buffalo NY markets. Clearwire plans to add 2-3 markets before the end of 1999, and another 25 markets during 2000.

Chairman Kennard has stated repeatedly that the Commission gives its highest priority to fostering competition in the delivery of local broadband services.⁷ Clearwire and its competitors

⁶ Clearwire is a privately held company, founded in 1998 as a spin-off from Sierra Technologies, Inc. (Neither company has any connection with the similarly-named Sierra Digital Communications, Inc.) In addition to its Dallas headquarters, Clearwire also operates a technology center in Buffalo, New York.

⁷ "This year, we must focus on the challenge of bringing high-speed, broadband Internet access to all Americans." Address of William E. Kennard, Chairman, Federal Communications Commission, Comptel 1999 Annual Meeting and Trade Exposition, Atlanta, GA, 1999 FCC Lexis 506 (Feb. 8, 1999). "I want to see more competition in the market for broadband services, not less." FCC Chairman William E. Kennard Association of Local Telecommunication Services (ALTS) Convention Nashville, TN (as prepared for delivery), 1999 FCC Lexis 1893 (May 3, 1999). "Indeed, broadband is just a nascent industry. The fact is that we don't have a duopoly in broadband. We don't even have a monopoly in broadband. We have a 'no-opoly. The bottom line is that, most Americans don't even have broadband. So how do we get Americans broadband pipes? The answer lies in . . . letting a competitive marketplace thrive." Remarks by FCC Chairman William E. Kennard, Before the Federal Communications Bar Northern California Chapter, San Francisco, CA (as prepared for delivery), 1999 FCC Lexis 3413 (July 20, 1999). "[W]hen you look at who's logging on [to the Internet], it breaks along

directly promote that policy. Where end users of broadband services traditionally have had to choose beyond the two wired monopolies — the telephone local loop and the franchised cable operator — Part 15 providers now offer a third practical alternative, without embroiling the Commission in acrimonious disputes over access to telephone and cable facilities. Yet, even though Clearwire and others provide last-mile facilities at their own expense, they still compete on favorable terms with telephone and cable. The growth of these businesses is direct evidence — measured in purchase orders — that the market needs this additional option. Clearwire offers precisely the local broadband competition that the Commission holds to be in the public interest.

Every service that uses unlicensed equipment must accept interference from licensed users, including Amateur licensees. Clearwire does not dispute this principle. Like any prudent provider, Clearwire makes its investment, designs its equipment, and plans its deployments subject to known sources of interference, based on Commission rules in place at the time. But subsequent changes to those rules may adversely impact a Part 15 service. No one can seriously question that Part 15 operations are in the public interest. And Part 15 providers have every right

income levels and race. We've got to have a sense of urgency, and do everything we can." Chairman William Kennard, *quoted in* David Lieberman, *America's Digital Divide*, USA Today (Oct. 10, 1999), www.usatoday.com/money/bcpvmon.htm. "The competition unleashed in these traditional sectors also brings us closer to another goal of the Act: the deployment of advanced, broadband services to the American people." Oral Testimony of William E. Kennard, Chairman, Federal Communications Commission Before the Senate Commerce Committee, 1999 FCC Lexis 2367 (May 26, 1999). "[C]onsumers are beginning to see competitive choices in local telecommunications services, competitive deployment of advanced broadband services is well underway . . . [T]he challenge before this Commission is clear: to promote competition, to foster new technologies, . . . and to ensure that all Americans have access to the wonders of the communications revolution." Statement of William E. Kennard Chairman, Federal Communications Commission Before the Subcommittee on Commerce, Justice, State, and the Judiciary Committee on Appropriations, United States Senate on the Federal Communications Commission's Fiscal Year 2000 Budget Estimates, 1999 FCC Lexis 1248 (March 25, 1999).

to ask that the Commission consider that public interest when admitting new kinds of licensed equipment to the band.

As noted above, Clearwire supports the substantive actions in the Report and Order: more flexibility for Amateur licensees in spread spectrum operations, as-needed power up to 100 watts, and relaxed record-keeping and station ID requirements. Clearwire seeks only two provisions to facilitate enforcement of the rules, while minimizing any added burden on Amateur operators and equipment manufacturers.

C. The Commission Should Require Certification of Amateur Spread Spectrum Transmitters Capable of Operation Over One Watt, and Should Require Publication of Information Needed to Decode Station IDs.

As a co-user of a shared band, Clearwire has a legitimate interest in enforcement of the Amateur technical rules. Clearwire believes it can function satisfactorily alongside Amateur transmitters that operate in compliance with the rules. By the same token, however, Clearwire stands to be seriously harmed by Amateur transmitters that violate the rules. In particular, a Clearwire receiver trying to monitor a 190 milliwatt transmitter from 40 km away will be vulnerable to nearby Amateur equipment that fails to comply with the automatic power control requirements of Section 97.311(d). Part 15 users must accept interference from an *authorized* station,⁸ but not from one that operates unlawfully. Clearwire is concerned that unscrupulous manufacturers may cut corners on the automatic power control function, or even omit it entirely. That occurrence could create widespread, devastating interference to legitimate Part 15

⁸ 47 C.F.R. § 15.5(b).

operations. Yet for the Commission to detect and identify violators under the present rules may be very difficult.

To facilitate enforcement, and hence minimize unlawful interference to Part 15, Clearwire requests two additional provisions in Section 97.311. Proposed language appears in Appendix A.

Proposed paragraph (e) requires certification for compliance with the technical rules, including that on automatic power control, for spread spectrum transmitters capable of operation over one watt in the bands shared with commercial spread spectrum operation. There is precedent for this provision. Sections 2.815 and 97.315 require certification of certain external RF amplifiers for Amateur use that threaten interference to other users if designed or constructed unlawfully. A similar threat of interference supports a similar certification requirement here.

Proposed paragraph (f) clarifies station ID requirements. Clearwire does not oppose eliminating the requirement that a station ID be detectable on a narrowband channel or with conventional CW or phone receivers.⁹ This change, however, may authorize the transmission of station IDs that are extremely difficult to read, possibly as part of the spread spectrum signal. Obviously this would defeat the purpose of the station ID. Clearwire therefore requests that the manufacturer be required to provide any information or algorithms needed to detect and decode the station ID on a publicly accessible website identified in the certification application. There is a close precedent for this requirement as well, in the rules governing identification of transmitters

⁹ See Report and Order at ¶ 20.

in the 59-64 GHz band.¹⁰ To facilitate making contact within an interfering station, the station ID for a spread spectrum transmitter should consist of both call sign and telephone number.

At the same time, however, Clearwire respects the tradition of individual experimentation that has long motivated innovation in the Amateur Radio Service, and does not wish to propose rules that impede technical creativity. For that reason, proposed paragraph (g) offers an exemption from all of these requirements for transmitters constructed or modified by the licensed Amateur operator, or by another Amateur licensee in quantities not to exceed one per calendar year.

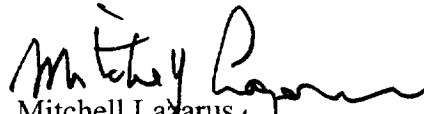
CONCLUSION

Clearwire is concerned that improperly designed or constructed Amateur spread spectrum transmitters will cause untoward interference to commercial Part 15 operations in the 2.4 GHz band, including Clearwire's provision of broadband Internet access. Clearwire therefore requests a certification requirement for Amateur spread spectrum transmitters capable of operating at powers over one watt. Clearwire further requests a clarification that Amateur spread spectrum transmitters be capable of transmitting a user-programmable call sign and telephone number, and that manufacturers be required to publish the information needed to decode this data. At the same time, Clearwire supports exemptions from both requirements for small quantities of Amateur-constructed equipment and for equipment constructed or modified by the licensee.

¹⁰ "Each application for equipment authorization must declare that the equipment contains the required transmitter identification feature [including 24 bytes of field programmable data] and must specify a method whereby interested parties can obtain sufficient information, at no cost, to enable them to fully detect and decode the transmitter identification information." 47 C.F.R. § 15.255(i).

Clearwire believes these provisions strike a reasonable balance between minimizing burdens on the Amateur Radio Service and its manufacturers, and facilitating enforcement of the rules needed to protect Part 15 from unlawful interference.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mitchell Lazarus". The signature is fluid and cursive, with the first name "Mitchell" being more prominent than the last name "Lazarus".

Mitchell Lazarus
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October 25, 1999

Counsel for Clearwire Technologies, Inc.

APPENDIX

§ 97.311 SS emission types

Paragraphs (e)-(g) are added as follows:

(e) Transmitters (including kits for constructing or modifying transmitters) capable of operation at output powers in excess of one watt in the bands specified in Section 15.247 must be certificated pursuant to the procedures in subpart J of Part 2 of this chapter prior to marketing.

(f) Transmitters capable of operating in the bands specified in Section 15.247 must be able to transmit automatically at least 24 bytes of user-programmable data at the beginning and end of communication and at least once every 10 minutes during a communication. An operating transmitter must be programmed with the station call sign and telephone number. Any information or algorithms needed to detect and decode this data must be made available on a publicly accessible website identified in the certification application. Organizations of Amateur licensees are encouraged, but not required, to collect this information on their publicly accessible websites.

(g) The requirements of paragraphs (e) and (f) do not apply to a transmitter constructed or modified by the licensee who operates it, or constructed or modified by another Amateur licensee in quantities not to exceed one per year.

CERTIFICATE OF SERVICE

I, Deborah N. Lunt, a secretary for the law firm of Fletcher, Heald & Hildreth, P.L.C., hereby certify that I have this 25th day of October, 1999, caused a copy of the foregoing "**Petition for Partial Reconsideration of Clearwire Technologies, Inc.**" to be hand delivered to each of the following:

Chairman William E. Kennard
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Commissioner Harold Furchtgott-Roth
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Commissioner Michael Powell
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

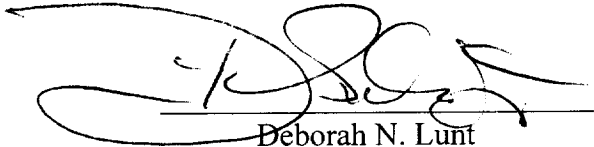
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