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To: Ms. Marlene H. Dortch, Esq.
Secretary
Federal Communications Commission
236 Massachusetts Ave., NE, Suite 110
Washington, DC 20002

Subject: Notice of Agere Systems Written Ex Parte Filing via the ECFS

Dear Ms. Dortch:

This letter is to serve as notice that the attached document, entitled "Written Ex Parte Presentation of Agere Systems" was filed with the Commission in ET Docket No. 99-231 via the ECFS on May 8, 2002.

Additionally, copies were sent via e-mail to the following Commission personnel:

Mr. Peter A. Tenhula, Senior Legal Advisor to Chairman Powell
Mr. Bryan Tramont, Senior Legal Advisor to Commissioner Abernathy
Mr. Jordan Goldstein, Senior Legal Advisor to Commissioner Copps
Mr. Sam Feder, Legal Advisor to Commissioner Martin
Mr. Julius Knapp, Deputy Chief, OET
Ms. Karen Rackley, Chief, Technical Rules Branch, OET

/s/

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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)	
)	
Amendment of Part 15 of the)	
Commission's Rules Regarding Spread)	ET Docket No. 99-231
Spectrum Devices)	
)	DA 01-158
Wi-LAN, Inc.)	
Application for Certification of an)	
Intentional Radiator Under Part 15 of The)	
Commission's Rules)	

Written Ex Parte Presentation of Agere Systems

Agere Systems (“Agere”) is a leading manufacturer of Wireless Local Area Network (“WLAN”) devices and equipment compliant to the IEEE 802.11b standard that operates at transmission rates of up to 11 Mbps in the 2.4 GHz band as unlicensed Part 15 devices. Agere is also a promoter member of the Bluetooth SIG, Inc. and a manufacturer of FHSS products compliant to the Bluetooth specification.

Agere actively participates in the IEEE 802.11 Local Area Network Standards Committee’s Task Group G, which is developing extensions for systems that would operate under the category of Digital Transmission Systems (“DTSs”), for which the Commission is considering enabling changes to its rules in this proceeding. Agere is also actively developing DTS products.

As such, Agere is an interested party in this proceeding .

Introduction and Executive Summary

1. On May 10, 2001, the Commission adopted a Further Notice of Proposed Rule Making and Order (the “*Further Notice*”)¹ in the above-captioned proceeding, prompted, at least in part, by a petition filed by Agere (Agere was at that time a division of Lucent Technologies) and a group of other interested companies (the “Petitioners”) who jointly requested that the Commission adopt changes in its rules that would make it practical to use adaptive frequency hopping techniques (“adaptive hopping”) in the 2.4 GHz band (2400 - 2483.5 MHz).
2. The fundamental purpose of the changes requested by the Petitioners was to eliminate, or at least greatly reduce, *unnecessary* and *avoidable* interference between Frequency Hopping Spread Spectrum (“FHSS”) systems (such as Bluetooth), Direct Sequence Spread Spectrum (“DSSS”) systems (such as IEEE 802.11b), and the new types of Digital Transmission systems (“DTS”) that were also addressed by the Commission in the *Further Notice*.
3. Requiring systems with bandwidths of approximately 1 MHz, such as Bluetooth, to hop over at least 75 hopping frequencies makes it fundamentally impossible for such systems to avoid collisions with wider bandwidth, frequency static systems such as IEEE 802.11b Wireless Local Area Networks (“WLANs”), because the span of the hopping frequencies covers so much of the band that it is impossible to avoid hopping, at least on some of the hops, within the channel used by a WLAN device, resulting in collisions and a loss of performance for both systems.
4. However, the use of a smaller hopset², ***coupled with a means of intelligently and adaptively selecting those hopping frequencies based on the interference environment (which varies over time and as portable or nomadic devices move)***, would allow FHSS systems to avoid collisions with one or more WLAN devices operating in the band in the same area, and also to avoid collisions with other FHSS systems.

¹ *Further Notice of Proposed Rule Making and Order, FCC 01-158, May 10, 2001.*

² (15 hopping frequencies was proposed as a minimum)

5. The Petitioners also proposed that systems using such a reduced hopset be limited to 125 mW maximum transmitter power output, rather than the 1 W limit that generally applies to FHSS and DSSS systems.

Adaptive Hopping Should be Required in Exchange for the Use of Reduced Hopsets

6. It is Agere's understanding that a draft Report and Order ("R&O") has been circulated to the Commissioners' offices by OET for review and possible action at the Commission's May 16, 2002 meeting. We are under the impression that the rules proposed in the draft R&O allow the use of a reduced hopset, at a reduced power level such as the 125 mW limit proposed by the Petitioners. That part is fine. However, we are *very* concerned that the rules proposed in the draft R&O *may not require* the use of adaptive hopping techniques in exchange for the ability to employ a reduced hopset.

Simply Imposing a 125 mW Transmitter Power Limit Will Not Reduce Interference in a Practical Sense Because Most Systems Already Use Less

7. We are also under the impression that there may be some members of the Commission's staff who may believe that a reduction in maximum allowable transmitter power from 1 W to 125 mW is sufficient to significantly reduce the possibility of interference between reduced hopset FHSS systems and wideband, frequency static systems such as 802.11b.

8. As a manufacturer of both Bluetooth products and 802.11b products, Agere respectfully disagrees with that viewpoint (if it is, in fact, held by some member(s) of the Commission's staff).

9. While a reduction in the maximum allowable power from 1 W to 125 mW would, at first blush, *theoretically* reduce the interference potential, we would hasten to point out that the maximum transmitter power allowed under the Bluetooth specification for a Class 1 Bluetooth device is 100 mW ... fully 10 dB lower than the 1 W that the Commission's rules currently allow. And the vast majority of Bluetooth devices will be Class 2 and Class 3 devices with transmitter output powers of +4 dBm and 0 dBm respectively (an additional 16 to 20 dB lower still).

10. We would also point out that the typical 802.11b device (a PC Card or mini-PCI card in a notebook computer) has a power output on the order of +15 to +18 dBm, or 32 to 64 mW.

11. Thus, *in practice*, the typical transmitter power levels for both Bluetooth and 802.11b devices are *already much* less than the Commission's rules currently allow.

12. Nevertheless, studies conducted by industry groups, such as the Bluetooth SIG's Coexistence Work Group and the IEEE 802.15.2 Coexistence Working Group, as well as other studies, have shown that, since systems such as Bluetooth and 802.11b will likely be used in proximity to each other with overlapping coverage areas, interference can and will occur.

13. Agere respectfully submits that the Commission's public interest objective should be to *maximize* the coexistence potential between FHSS systems (such as, for example, Bluetooth), DSSS systems (such as, for example, 802.11b), and the new class of DTSs that the Commission proposes to authorize so that the 2.4 GHz band can support the ever-increasing number of users in the frequency band.

14. We respectfully submit that permitting a reduction in the number of hopping channels without *also* simultaneously *requiring* the use of adaptive hopping techniques falls far short of maximizing the coexistence potential between the various occupants of the band, which is necessary to promote efficient use of the spectrum and in the interests of the users.

15. We would stress the fact that the Joint Petitioners³ asked the Commission for the ability to use reduced hopsets *specifically* in order to allow adaptive hopping techniques to be practically applied in the 2.4 GHz band.

³ See *Joint Petition for Clarification or, in the Alternative, Partial Reconsideration*, (the "Joint Petition") filed October 20, 2000 by 3Com, Apple Computer, Cisco Systems, Dell Computer, IBM, Intel Corp., Intersil, Lucent Technologies (Agere Systems was formerly the Microelectronics Group of Lucent Technologies), Microsoft, Nokia Inc., Silicon Wave, Toshiba American Information Systems, and Texas Instruments (the "Joint Petitioners")

16. *Simply reducing the hopset without incorporating the intelligence to adapt to the changing interference environment in the band does virtually nothing to improve coexistence and eliminate unnecessary interference.*

17. FHSS systems using reduced hopsets should evaluate the interference environment in which they operate on a continuous basis, adapting to a changing environment in a manner that avoids interference to and from other occupants of the band, particularly frequency static wideband systems such as 802.11b and DTS systems. *That was the entire purpose of requesting the ability to use reduced hopsets in the first place.*

Conclusion

18. For these reasons, Agere again strongly urges the Commission to **require** the use of adaptive hopping techniques, along with the proposed power limit of 125 mW, in exchange for the flexibility of employing hopsets as small as 15 hops for FHSS systems with 20 dB bandwidths of 1 MHz or less.

Respectfully submitted,

/s/

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