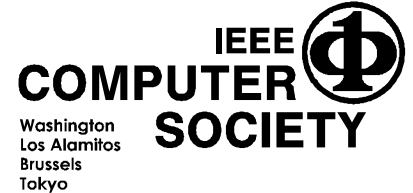


Standards Working Group IEEE 802

Local and Metropolitan Area Network Standards
Committee
Homepage at <http://grouper.ieee.org/groups/802/>



July 19, 1999

Magalie R. Salas, Esquire
Secretary
Federal Communications Commission
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Reply to: Vic Hayes, Chair, IEEE P802.11
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Re: ET Docket No. 99-231

Dear Ms. Salas:

IEEE 802, the LAN/MAN Standards Committee (“the Committee”), is writing in regard to ET Docket No. 99-231: Amendment of Part 15 of the Commission’s Rules for Spread Spectrum Devices. The Committee has studied the proposed changes regarding operating rules for Frequency Hopping Spread Spectrum (FHSS) devices. The Committee respectfully submits this statement in opposition to the proposed rules changes that would allow wider multiply overlapped (5 times) channels for FHSS systems.

The Institute of Electrical and Electronics Engineers, Inc. (IEEE) is a USA-based international professional organization with more than 325,000 members representing a broad segment of the computer and communications industries. IEEE 802.11, a chartered Working Group under the Committee, has developed a standard for Wireless Local Area Networking (WLAN) in the 2400-2483.5 MHz band (“the 2450 MHz band”). The number of individuals and corresponding company sponsorships in the IEEE 802.11 Working Group evidences the strong interest in wireless local area networking. The Working Group currently has over 200 members employed by 86 companies.



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The Committee has reviewed the proposed changes in the Notice of Proposed Rule Making released by the Commission on June 24, 1999 (document FCC 99-149). We make the following comments:

- a. The use of heavily overlapped channels for FHSS systems will result in significantly increased interference between systems employing this method of channel selection. This is due primarily to two side effects of overlapped channels. First, nearly all commercially available FHSS systems employ non-coherent FSK modulation. Studies on the effect of partially overlapped channels on systems employing FSK modulation have concluded that the interference from a partially overlapped channel is more severe than either co-channel or adjacent channel interference. Secondly, regardless of the modulation method employed, spectrum-sharing etiquette will be inhibited by the use of overlapping channels. Specifically, the effectiveness of Clear Channel Assessment (CCA) mechanisms is reduced. CCA will be reduced to simple energy detection, as opposed to carrier sense/code lock mechanisms that are far more effective means of facilitating spectrum sharing when two FHSS networks share the same frequency band.
- b. The Committee concludes that the proposed rules changes will result in systems that cause increased levels of interference to existing FHSS and DSSS systems. In general, a faster hop rate for FHSS systems represents a more severe interference threat than does an FHSS system employing a slower hop rate. We note that there is no regulatory prohibition against the use of systems that have higher hopping frequencies, but we are of the opinion that the Commission should not make higher hop rates mandatory. The higher hopping rates appear to be an attempt to mitigate the increased interference of the proposed wider channels. However, this measure

actually increases the probability of interference to more channels of existing standard FHSS and DSSS systems.

- c. In addition, we find that the proposed reductions in transmitted RF power for systems using 3 MHz or 5 MHz channels (collectively referred to as Wide Band Frequency Hopping, or WBFH systems) will not effectively offset the impact of wider occupied channels. This is true because nearly all WLAN systems sold today operate well below the allowable FCC limit of 1 W for transmitted power. Current systems typically transmit about 100 mW. However, we note that in its letter of November 11, 1998 to the Commission, the HomeRF Working Group indicated that it envisions systems having high spectral efficiency (2 bits/sec/Hertz) which will be suitable for transmission of high quality audio and video streams. In order to achieve reliable operation, such systems will very likely be required to operate at the proposed maximum allowable power levels. This will have the practical effect of either forcing systems based on current spread spectrum rules to operate at higher power levels, or to accept reduced range due to interference from WBFH devices. Neither outcome will promote the effective use of the spectrum for high-speed wireless data networking.
- d. We further note that the resulting increase in interference described above will hinder market acceptance of high-speed wireless networking products that operate in the 2.45 GHz ISM band. IEEE 802.11 already has developed a standard for high speed wireless networking which will meet all of the objectives expressed in the HomeRF Working Group's letter of November 11, 1998. We therefore are of the opinion that no changes in the Commission's rules for spread spectrum operation in the 2.45 GHz ISM band are required.

Summary

In summary, we find that the proposed rules changes for WBFH systems will result in high levels of self interference among systems employing these measures due to the increased level of interference resulting from the use of 5x multiply overlapped channels and the impairment of CCA mechanisms. Further, WBFH systems pose an interference threat to existing FHSS and DSSS systems due to a mandatory increase in hop rate and the higher transmitted power levels which will be required for reliable operation of these systems. We are therefore opposed to the proposed rule changes for FHSS systems and urge the Commission to reject these measures.

Respectfully,

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