

Before  
**INDUSTRY CANADA**  
Ottawa, Ontario, Canada

In the Matter of ) Notice Number  
Licence Exempt-Local Area ) DGTP-010-98  
Networks in the 5GHz Range ) June 1998

**COMMENTS OF IEEE 802 LAN/MAN STANDARDS COMMITTEE.**

**Introduction**

IEEE 802, the LAN/MAN Standards Committee (“the Committee”) respectfully submits the following comments in response to the document entitled “Proposed Spectrum Policy For Licence Exempt Wireless Local Area Networks in the 5GHz Range.”

The Committee shares Industry Canada’s concern about the development of a diversity of wireless access facilities to promote a world-class information infrastructure and particular interest in high-speed computer connections and the delivery of multimedia services.

The Committee’s standard on Wireless LAN Media Access Control and Physical Layer Specification, IEEE Std 802.11 - 1997, operates in the 2450 MHz ISM band using spread spectrum procedures under 47 CFR 15.247 in the US and RS 210 in Canada, as well as other regulatory domains. The Committee has initiated work on a draft standard for operation in the 5 GHz range, to support a wide range of innovative LE-LAN system and device applications.

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. More than 58,000 members are from outside the USA. Within the IEEE, the IEEE Standards Association (IEEE-SA) is an ANSI accredited standards development organization.

The IEEE 802 LAN/MAN Standards Committee (IEEE 802) operates under the IEEE-SA to produce specific interoperability standards for Local Area Networks. The Local Area Network standards provide for data transfer between computers and/or computer terminals and include such widely known standards as Ethernet and Token Ring as well as the Wireless LAN standard. Many of the IEEE 802 standards have been adopted by the ISO/IEC as International Standards.

In 1997, the Committee adopted IEEE Std 802.11 - 1997, a standard for wireless Medium Access Control and Physical Layer protocols using the 2450 MHz ISM band for data rates up to 2 Mbit/s. Participants have a major investment in the development of the standard. Since 1990 when the effort started, the IEEE 802.11 Working Group has assembled 6 times a year to develop the draft, with an average of 80 persons participating. The participants are employed by companies from industries, such as manufacturers of computers, computer peripherals and chips and radio equipment, as well as aircraft manufacturers, service industries, government agencies and heavy industry. In addition to participants from the USA, there are participants from locations over the world, such as Canada, Europe, Japan, Israel, Korea and the Republic of China.

The ISO/IEC international standards organizations adopted an updated version of IEEE Std 802.11 - 1997 as an International Standard. The combined IEEE/ISO/IEC standard will be published in October of this year.

Additionally, the IEEE 802.11 Working Group is working to extend the standard for operation at higher data rates in the 5GHz range.

The strong interest in wireless local area networking is evidenced by the number of individuals and corresponding company sponsorships in the IEEE P802.11 working group. The IEEE 802.11 Working Group currently has 86 voting members employed by 58 companies.

The following is a partial list of companies that are already offering or have announced standards-based components or products:

- Aironet Wireless Communications Inc
- AMD
- Bay Networks
- Breezecom
- Cabletron Systems Inc.
- Harris Semiconductor
- InTalk
- Intermec
- Lucent Technologies
- No Wires Needed
- NDC Communicatons
- OKI Semiconductor
- Phillips Semiconductor
- Proxim
- Raytheon
- Symbol Technologies

The growing market acceptance of wireless LANs is evidenced by an industry growth rate of between 40% and 60% for the past 5 years. The introduction of the IEEE standard is expected to accelerate wireless LAN adoption.

### **Detailed Comments**

Wide regional and global designation of spectrum for similar usage is important to the successful implementation of new wireless services and technologies. The US U-NII regulations

allocate 300 MHz in the 5 GHz range for unlicensed use, and in Europe, CEPT provides 150MHz from 5.15GHz to 5.30GHz for unlicensed high-speed computer connections. The IEEE 802.11 Committee warmly supports Industry Canada's efforts to provide Licence Exempt Local Area Network spectrum. It will be an important step in making licence exempt 5 GHz spectrum globally available for innovative applications and services.

The IEEE 802.11 5GHz Higher Speed Working Group intends to coordinate the IEEE 5GHz draft standard with the ETSI BRAN project. The Working Group has selected an Orthogonal Frequency Division Multiplexing modulation, which is also a leading candidate for ETSI standardization, as a basis for its standard and has appointed a liaison to ETSI for the purpose of defining common modulations.

#### Lower and Middle Band Distinctions

Industry Canada asks for comments on what limitations on characteristics and operation should be imposed on LE-LAN devices in 5150-5250 MHz (the lower band) to assure compatibility with aeronautical radionavigation and fixed satellite services (insert footnote for section 3.1a of DGTP-010-98).

The Committee notes that there are restrictions to inside-only operation and severe limits to the permissible power level in the lower band in the US and that such restrictions are being considered for other countries. We request that Industry Canada permit the lower band power level be the same as that of the middle band and that no restrictions on outside operation should

be imposed.

The lower band restrictions were imposed in the US because of a misconception concerning the interaction on U-NII devices with the Fixed Satellite Service (FSS) feeder uplinks.

WINForum and Apple Computer has shown that even with liberal assumptions on U-NII device population and other operational parameters, the effect of U-NII devices on FSS feeder uplinks is undetectable. In fact, WINForum and Apple has shown that even with the a very extreme set of assumptions suggested by a member of the satellite industry concerning the population and operational patterns, the effect on FSS feeder uplinks is less than 0.1% capacity reduction

[For example, 30 million LE-LAN devices, each operating at a duty cycle of 50% (i.e., every unit is always either transmitting or receiving), would cause a reduction in the baseband signal-to-noise ratio of only about 0.003 dB, and a capacity reduction (according to the AirTouch formula) of less than one-tenth of one percent. With more realistic assumptions about LE-LAN operation (e.g., a 1% average duty cycle), the impact would be vanishingly small. Considering that the Globalstar forward link includes more than 13 dB of margin, it is clear that the LE-LAN devices will not have any significant impact on the operation of Globalstar. ](insert footnote referencing a WINforum Ex-Parte presentation attachment, capdegr3.doc. Must check on how to reference this - possibly an excerpt is needed).

The availability of 200MHz of contiguous spectrum can permit more channels of service than operation in two 100MHz bands sharing a common boundary, as a channel can be made to span the common boundary with minimal implementation complexity.

The Committee requests that Industry Canada harmonize the 5.15-5.35GHz lower and middle bands with ETSI 5.15-5.30GHz HIPERLAN 1 regulations and United States Unlicensed-National

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Information Infrastructure 5.25-5.35GHz middle band regulations, permitting 1 Watt Equivalent

Isotropic Radiated Power and outdoor operation.

