IEEE P802.11
Wireless LANs
Draft Letter to UK-RA

Date: November 10, 1999

Author: Regulatory Ad Hoc Group

First, IEEE 802.11 would like to thank the Radio Agency for including us in your inquiry and allowing us to comment. These subjects are also very much on the minds of the IEEE 802.11 participants and the companies they represent.

IEEE 802.11 (ISO 8802.11) is an interoperability standard designed and desired to work worldwide. The IEEE 802.11a PHY (physical layer) specification is being developed as the wideband 5GHz addition to the 802.11 family. The 5.15GHz bands are very important to IEEE and represent an opportunity for high data rate and high bandwidth communications worldwide. The UK approval of IEEE 802.11 devices in the 5.15GHz bands is very important to this goal.

The IEEE 802.11 committee is examining the needed changes required in the 802.11 MAC in order to operate under European requirements.

In general, our interpretation of HIPERLAN0 at 5.15GHz is that it allows any number of proprietary implementations with minimal regard to coexistence and mutual interference, the only restriction being simple radio parameters (power spectral density and possibly channelization). Although the 802.11 committee has been pleased by the actions of many of the regulatory agencies, there are, in hindsight, some reservations about how the spectrum was allocated and regulated. For example, in the US, the Unlicensed National Information Infrastructure (UNII) frequencies are equivalent to HIPERLAN0 and allow both low and high bandwidth and low and high signalling rate devices to operate in the same spectrum. This approach potentially makes the spectrum less usable for the intended (broadband) application requirements. IEEE 802.11 would like to see appropriate coexistence requirements placed on future wideband spectrum allocations to ensure the spectrum is more useful for high quality, wide bandwidth, high signalling rate systems. So, IEEE 802.11 would recommend some restrictions on the use of all future wideband spectrum to exclude low data rate devices such as garage door openers, narrowband cordless phones, etc.

IEEE 802.11 is not a candidate for a HIPERLAN0 solution, however it is a complete interoperability standard that should be allowed to operate worldwide. Instead of a HIPERLAN0 solution, it is the opinion of the IEEE 802.11 committee that IEEE 802.11 should be an integral part of the UK's RLAN plans.

The questions Q1 through Q5 are copied directly out of your inquiry asking for IEEE 802 input:

Q1   *HIPERLAN Type 1 and HIPERLAN Type 2 are each open interoperability standards produced by representatives of manufacturing industry, application designers and potential users. It is currently Agency policy that RLANs in the bands 5.150-5.350 GHz and 5.470-5.725 GHz should be restricted to HIPERLAN equipment complying with the relevant ETSI specification. Is there a case for the development of a parallel co-existence standard (HIPERLAN Type 0?) based only on simple radio parameters to allow proprietary equipment to share the bands on a licence exempt basis?*

IEEE 802 feels that the 5GHz band is the only broadband spectrum available to the general public. Therefore, it should be preserved for broadband applications. In considering the desired result of a general purpose high bandwidth wireless communications capability, there need to be some controls on the spectrum in order to preserve it for broadband applications. It cannot be totally unregulated; applications such as garage door openers at 5GHz would be a waste of this wideband spectrum. We think, as a minimum, coexistence parameters should be included to insure the broadband nature of the spectrum is maintained. There needs to be some support for collaborating/coexisting with the HIPERLAN1 and 2 and IEEE 802.11.

Q2   *If HIPERLAN Type 0 is not adopted by ETSI for European wide introduction is there a case for the UK to develop and introduce such a standard on a UK only basis?*

No, the success of the 5GHz bands is dependent on the availability of low cost radios. To have a UK-only solution would not allow competitive forces to work on a worldwide basis to reduce the cost of the hardware and services.

Q3:   *Given the diversity of potential uses, what are the likely applications for these bands, what development issues remain unresolved, and when and how will services be introduced?*

What are the likely applications for these bands?

The likely end-user applications are all the high speed data office and home applications that we run on our wireline systems today. In addition, high quality voice and video can be delivered to the nomadic user via 5GHz broadband wireless.

What development issues remain unresolved?

Mobility and nomadicity across communications domains are still in a relatively primitive state that are being worked, but are not ready to be deployed yet.

When and how will services be introduced?

When the products are at the right price to be attractive to the appropriate segment of the population. The introduction of services by small service providers (entrepreneurs) will indicate that the market forces and public demand are adequate to encourage rapid business growth and fielding of niche markets.

Q4:   *It is currently envisaged that HIPERLAN compliant services will be private system use only. Is there a requirement for public access systems in these bands, what kind of systems would be envisaged, and how should they be regulated?*

No, the public systems should be provided by other means (GSM, etc).

Q5:   *Within the HIPERLAN family of standards, HIPERLAN Type 1 and HIPERLAN Type 2 systems are technically incompatible, therefore how best should these bands be assigned, given the aim of frequency assignment is to ensure that the maximum numbers of users get appropriate and fair access to spectrum for their applications? In considering this it should be borne in mind that these devices are likely to be incorporated into Recommendation 70-03 which will permit their movement across national borders and their licence exempt use across CEPT.*

This is the only broadband spectrum with public access, the low bandwidth applications should be excluded. The way to accomplish this is to place some restrictions on the spectrum use by low bandwidth applications.

The band should not be partitioned, so option 1, row 1 of the table of section 10.3 is the most acceptable solution for IEEE 802.11. See below:

1	No partitioning of the bands.	All services co-exist on a licence exempt basis. No public access services are permitted
2	No partitioning of the bands.	All services co-exist on a licence exempt basis. Public and private systems are permitted to co-exist. However co-ordination and interference resolution is the responsibility of the operator and third party customers are not guaranteed access to spectrum at all times.
3	Bands are partitioned on the basis of public access/private system requirements.	Public access systems require licences and are co-ordinated. Private systems are licence exempt and uncoordinated.
4	Bands are partitioned on the basis of HIPERLAN Type 1 and 2 but not on public/private basis	All systems are licence exempt and uncoordinated.

Of the broadband spectrum allocated, coexistence is critical for the wideband technologies. Because coexistence is critical, there should be a radio qualification scenario that meets the coexistence criteria.

Thank you for considering the IEEE 802 points of view in this matter.