Standards Working Group IEEE 802.11

Standards Working Group for Wireless LANs
Homepage at http://grouper.ieee.org/groups/802/11

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Reply Comments

Re: Consultation Document
Short Range, High Data Rate, Nomadic Equipment
Operating in the frequency range 5.150 to 5.875 GHz

Dear Ms. Henley,

Working Group 11 of the IEEE 802 LAN/MAN Standards Committee (IEEE 802.11) would like to thank the Radio Agency for including us in your inquiry and allowing us to comment on the "Consultation Document, Short Range, High Data Rate, Nomadic Equipment operating in the frequency range 5.150 to 5.875 GHz" (the Consultation Document). The subject of this document is very much on the minds of the IEEE 802.11 participants and the companies they represent.

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

IEEE 802.11 worked with ETSI BRAN and MMAC of Japan to establish a high degree of commonality between the respective standards of each organization. There is agreement on the

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channelization and basic modulation of the 5 GHz IEEE 802.11 and HIPERLAN standards in the

5.15 to 5.35 GHz bands. In addition, IEEE 802.11, HIPERLAN and MMAC use the same

modulation and channel bandwidths in these bands.

In anticipation of acceptance in Europe and the UK, the IEEE 802.11 committee is now

examining the ~~needed~~ necessary changes required in the 802.11 standard in order to operate

under the requirements of the recent ERC decision which are related primarily to sharing the

band with other systems. The requirements for dynamic frequency selection, transmitter power

control, statistical distribution of channels etc. are being studied. The ERC requirements will be

included in any system proposed for operation there.

Our interpretation of the HIPERLAN0 coexistence approach is that it allows any number

of proprietary implementations with minimal regard to intra-RLAN coexistence, the only

restriction being simple radio parameters (power level, power spectral density, out-of-band

emissions etc.). For example, we interpret HIPERLAN0 as equivalent to the Unlicensed National

Information Infrastructure (U-NII) regulations in the US in this respect. The US regulations are

based only on protecting primary and licensed users of the spectrum; they allow a wide range of

proprietary systems of both low and high bandwidth and low and high signalling rate 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 such as the HIPERLAN family and the 802.11 standard.

So, IEEE 802.11 would recommend coexistence rules sufficient to insure that the band is used

for these applications.

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If the HIPERLAN0 approach is chosen, then the coexistence requirements should be much more extensive than those of the U-NII rules in the US. For example, a channelization scheme consistent with the bandwidth and frequency assignments developed via the cooperative effort of IEEE 802.11, ETSI BRAN and Japan MMAC should be adopted as a regulatory requirement.

The IEEE 802.11 standard for operation in the 5 GHz range is a complete interoperability standard intended for high speed, high bandwidth applications. It uses the common bandwidth and modulation scheme adopted by ETSI BRAN and Japan MMAC in cooperation with IEEE 802.11. By virtue of the channelization scheme, IEEE 802.11 systems will coexist with HIPERLAN 1 and 2 in the same location in the 5 GHz band using different channels. The recent ERC decision makes over 17 channels available in the 5 GHz band for systems compliant with the decision and using this common bandwidth and channelization scheme. In locations where all three types of systems operates there should be ample spectrum for achieving coexistence. Thus, opening up the spectrum to another international standard system with this degree of coexistence potential should promote healthy competition and will be to the ultimate advantage of all UK citizens.

It is the opinion and request of the IEEE 802.11 committee that systems in the 5 GHz bands operating in accordance with the IEEE 802.11 standard should be an integral part of the UK's RLAN plans.

The following are the responses of IEEE 802.11 to questions Q1 through Q5 are which are taken directly from the Consultation Document:

*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?*

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IEEE 802 ~~feels~~ believes 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 needs to be some control on the spectrum ~~in order~~ to preserve it for broadband applications. It cannot be totally unregulated; low device quality, narrow band applications (garage door openers for example) at 5 GHz would be a waste of this spectrum. We think, as a minimum, coexistence parameters including the channelization scheme now specified for HIPERLAN, MMAC and IEEE 802.11 should be included to insure the broadband nature of the spectrum is maintained. At a minimum, there needs to be some regulatory support for collaborating/coexisting with 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?*

The UK should permit operation of the IEEE 802.11 interoperability standard even if ETSI does not adopt a HIPERLAN0 approach and even if other European nations do not accept 802.11. However, in this case, acceptance should not be as a part of an agreement permitting a wide range of proprietary systems such as would be the case with HIPERLAN0 as we now understand it.

We anticipate that the 802.11 standard will gain wide acceptance in nations where it receives regulatory approval. This includes at least the US and we expect it to include other nations. It would be an advantage to the citizens of the UK if systems operating in accordance with this standard are permitted.

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?*

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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 5 GHz broadband wireless.

What development issues remain unresolved?

Mobility and nomadicity across communications domains ~~is~~ arestill in a relatively primitive state that is being worked but is 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. The date will be advanced if products consistent with good spectrum use and coexistence are permitted to compete to fill the proper niches at the right price. IEEE 802.11 compliant systems fit this description.

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.*

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

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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.
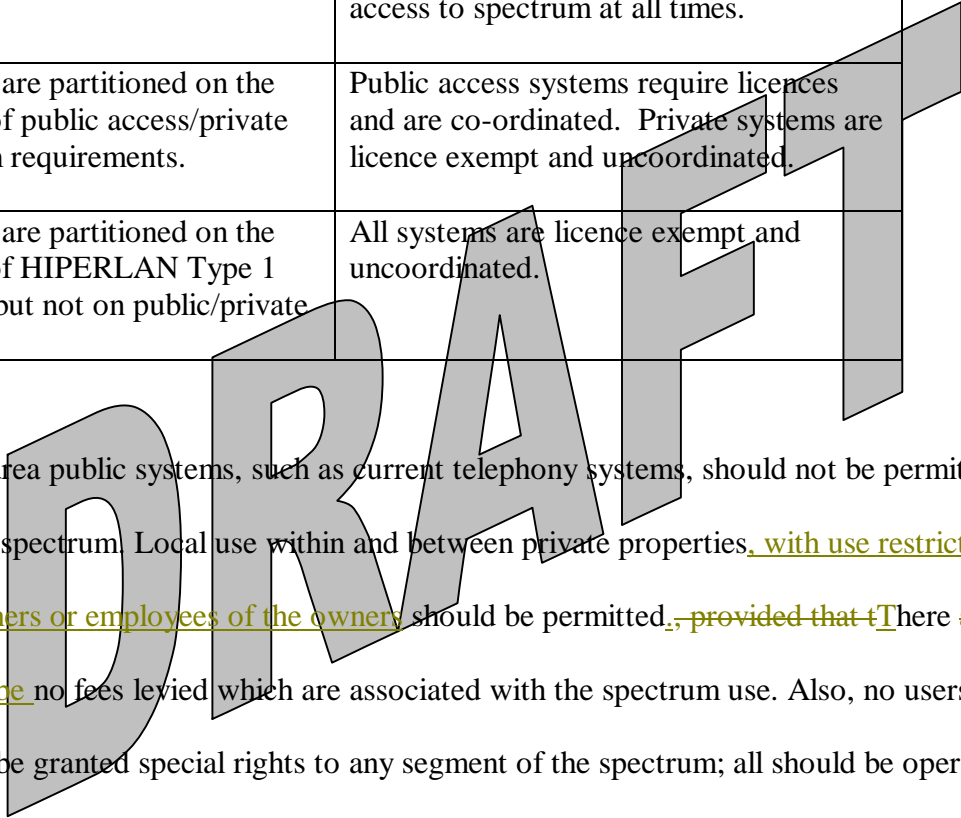
Large area public systems, such as current telephony systems, should not be permitted to use the spectrum. Local use within and between private properties, with use restricted to the owners or employees of the ownery should be permitted., provided that tThere are should be no fees levied which are associated with the spectrum use. Also, no users should be granted special rights to any segment of the spectrum; all should be operated on an equal license exempt or unlicensed basis.

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.

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

Respectfully,

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