

**Briefing for MPTSWG on use of RLAN equipment to provide
FWA services at 5.8 GHz.**

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Organisation: RA2/PBSU
Date: 11th September 2002

1. Introduction

The IT industry is exploring the use of radio to provide services that dispense with the need for complex fixed wired connections. This is likely to be a major innovative trend in IT and consequently the demand for radio spectrum for this purpose is increasing. The nature of the IT industry means that centralised, planned telecommunications networks are not a perfect fit for this requirement, although use of leased lines for various wireless IT connections cannot be dismissed.

The current direction and ethos of the IT industry is such that it favours do-it-yourself connections to promote organic growth of networks. This is partly due to a long experience of well planned, vast, expensive, white elephants. The success of the seemingly random development of the Internet has contributed to the sense that light regulation and minimal administration are the best way to develop.

This is an industry that has little experience of radio engineering and views the cumbersome process of frequency allocation, allotment and assignment with suspicion. An assumption is often made that the medium of transmission will always be available and that regulation equals unnecessary interference and is simply a form of taxation.

2. Wireless services

The 2.4 GHz ISM band is now available on a deregulated basis, in the UK, the US and most other EU countries. This has led to the development of a range of new and much desired services. These include laptop connection to the Internet from airport lounges and coffee shops and free access, self provided networks such as consume.net in the UK and other places. These services have proved to be very successful and thus far there has not been any widespread report of failure due to interference. There is therefore an assumption that this will not happen and the market has a great appetite for more similar and better services.

Consequently technologies are being developed to operate in the cleaner and more abundant bands at 5 GHz. For the most part it appears that equipment deployed will, in the main, be compatible with that that is currently being rolled out at 2.4 GHz. Many companies have already indicated that they have dual 2.4/5GHz products available or in development already.

3. Developments at 5 GHz

The RA is currently running a 28 day Public Consultation on the Statutory Instrument that will introduce similar regulations for two of the 5GHz bands A & B (5150 – 5350 MHz and 5470 – 5725MHz).

An RA Public Consultation Process on the use of these bands has been running since October 1999 and as a result PBSU has also put forward the technical details in draft IR 2006 for publication in the official journal of the EU for use of RLAN equipment within these bands. The latest version of IR 2006 and a copy of the Consultation document are available on the RA website. When both of these documents are approved and published (autumn 2002) Bands A and B will be available for RLAN deployment on a licence exempt basis.

PBSU does not intend to include preparation of the RLAN standards [IR2005(2.4GHz), IR2006(5GHz Bands A&B), EN 300 328(2.4GHz) and EN 301 893(5GHz Bands A&B)] in our submissions to MPTSWG since these standards address mobile and nomadic RLAN applications. However PBSU is willing to provide updates if requested by MPTSWG. The RA will be setting up a separate group to deal with both 2.4GHz and 5GHz RLAN technical, policy and standards issues.

3. FWA in Band C (5725-5875 MHz)

An area that has not developed as well as might have been expected in UK and wider across Europe is the development of broadband connections to both small business and residential locations. This is a major area of economic growth in North America and, while it can be said that Europe has compensated for the limitations by the ubiquity of cellular telephony services, it is an issue that concerns the business community and Government. The particular issue is the installation of connections in areas away from the network backbone. These are the most expensive and logistically difficult part of any network. Service providers are not keen to make investments with no guarantee of return and the householder or small business might be prepared to pay for their own connection to a pre-existing network but is often unwilling or unable to pay for large areas of network installation.

It is therefore no surprise that significant interest and demand has been registered in use of deregulated radio bands to provide a more fixed type of service thus giving access to broadband Internet and other 'best endeavours' types of applications on a simple 'plug and play' basis. The bands at 5 GHz have been identified as suitable having appropriate bandwidth and apparently lacking extensive other users. In the US 5725-5850 MHz has been allocated to this service with a maximum EIRP of 4 Watts. There has been a resulting significant growth in both public access providers and self provided networks. This experience has led to pressure for similar opportunities in the UK. The technologies proposed are the same or variants of those being put forward for the other 5 GHz bands albeit with a bias towards static rather than mobile operation.

4 Interaction with other FWA services

The applications under discussion should be viewed as complementary to licensed FWA services and indeed to other telecommunications services. Certainly it must be emphasised that operation of a 'best endeavours' services in a licence exempt band can in no way provide secure, reliable communications services. However these services can be offered as another option in a range of available choices.

5 Work in hand

RA is studying the Band C as part of on going work resulting from the recent Public Consultation on 5 GHz. From preliminary work it appears that with certain restrictions it will be possible to implement these services in this band. The work in progress is as follows:

5.1 Current use of Band C for Outside broadcast (OB) services

- Alternative SAP/SAB channel provision is to be agreed with JFMG, possibly 3 channels in the 5150-5350 MHz RLAN band. This option will not be feasible in 5250 – 5350 MHz due to sharing constraints for EESS active.
- The option of sharing with MSS feeder links in 5150 – 5250 MHz will be included in the Visualyse studies.
- Due to the decision by RA on RTTE allocation, one of the three channels used by JFMG is now unaffected. The analysis will now concentrate on the looking to allocate for two channels in the 5150 – 5250 MHz band.

5.2 Potential interference into radar

- The development of an RA position for discussion with MoD, and subsequent MoD approval is on going. Calculations on the DFS (dynamic frequency selection) parameters are being carried out.
- The investigation of the introduction of exclusion zones around areas of Radar if DFS implementation is delayed. The use of a light licensing regime will facilitate this if it is necessary.
- There are some plans to carry out test on radar detection within the laboratory in Whyteleafe. Manufacturers have been encouraged to come with DFS design and the Radiocommunications Agency will provide the facilities to test its efficiency.

5.3 Band sharing with road transport traffic telematics (RTTT)

- Initial sharing analysis seems to indicate that sharing between FWA and RTTT will not be a problem, however, RA has decided not to recommend operating in the 20MHz (5795MHz – 5815MHz) allocated to RTTT systems until more information regarding their deployment becomes available.
- It should be noted that the road tolling community is considering using 5GHz RLAN technology similar to that used in the band B of the 5GHz band.

5.4 Monitoring of current radio environment to establish likely levels of interference

- The report of the UK monitoring exercise will be published shortly. Initial results indicate that 5GHz Bands B&C are relatively empty apart from certain rural areas where missile test ranges are located and in the 5600 – 5650 GHz band where meteorological radars operate nation-wide.

5.5 Addressing FWA/FSS sharing issues.

- Some internal calculation and simulation work is currently in progress.
- BT is assisting RA by simulating the scenarios using Visualyse software.

6 CEPT/ETSI Matters

ETSI BRAN has set up the HIPERMAN project team to look at FWA bands below 11GHz. One of the issues under investigation by this group is operation of FWA services in the 5.8GHz ISM Band (Band C). The HIPERMAN group has produced a System Reference Document (see attached) and forwarded this to ETSI ERM for comment and approval to forward a request to CEPT WG FM to initiate sharing studies with other services. ERM have now forwarded this request and it will be discussed at the next FM meeting.

7 Time scales

It is hoped that this work will be completed by the middle of 2003 and that Band C can then be made available for this use under the agreed regulatory regime. This is a tentative time scale only and is not fixed.

8 Conclusions

The IT industry is exploring the use of radio to provide wireless services. . This is likely to be a major innovative future trend. Significant interest and demand has been registered in use of deregulated radio bands to provide a fixed type of service thus giving access to broadband Internet and other 'best endeavours' types of applications. These services will be as complementary to licensed FWA services.

RA will submit to MPTSWG details of the standards development under way for this service, which will be operated in Band C (5725-5875 MHz).

Work in hand suggests that with certain restrictions it will be technically possible to implement these services using a light touch licensing regime to operate in Band C. It is hoped to complete this work by the middle of next year.