

This document gives the input from Jim Lovette (Apple) and the PHY subgroup as per Tuesday, September 15, 1992, regarding the NPRM 90-314.

Issues or points to be raised in Comments (in addition to various positions already taken in prior filings).

1. 802's focus is wireless LANs.

2. 802 has previously asked for 70-140 MHz of spectrum for wireless LANs alone. You (the FCC) have offered "only" 20 MHz not only for WLANs but also for user-provided voice systems as well. In fact, based on the proposed channelization scheme, only about half of the 20 MHz is really earmarked for 802-type LANs. That is not enough.

3. 20 MHz is not enough for WLANs alone, and it certainly does not allow 802 or any other party to create etiquettes and protocols for successful sharing with services other than WLANs. While 802 has no overriding technical objection to sharing, even the most minimal sharing process requires a reasonable amount of spectrum.

4. Timeliness remains a major problem. The PCS NPRM is even worse than 902-9 in this respect.

5. The Commission suggests the possibility of an unlicensed-industry committee to (a) decide the rules or etiquettes and (b) act as the party to negotiate with fixed microwave users. 802 strongly supports the industry committee approach, but makes a special point that the committee should be highly technically oriented, as 802 is. 802 offers itself as a participant in this activity, and recognizes that other organizations (such as WINForum) that have membership of voice and other wireless services may be important as the central group. In other words, the committee should be representative of the technologies and applications that will use the band.

9,16,92 AM

LV: VH requested that we look at the specific numbers that are in the NPRM to see if there is anything we wish to say. In PCS section there is a spec on emission level on the boundry of their region. In general, an unlicensed user probably has controlled because he is the owner of a premiss, maybe we can specify an emission level on the boundry of his premiss and allow the owner who uses unlicensed devices to channalize or not as he wishes. This is page 47 paragraph 120. The attempt to channalize the unlicensed 20MHz is probably an attempt to allow different types of devices to not interfere with each other.

JM: but what do you do for more public areas such as retail

LV: the owner can make a selction of a subset so long as at boundaries he does not violate emissions to bother his neighbour

JM: areas in public such as airport, user does not control what devices,

LV: the issue is there someone who controls the areas

Burchel Cooper (BC): there is probably areas where this is not true, or users who are not aware enough to control

LV: radiated limits are based on measurment instruments based on average detector

LV: is data comunication betweeb computer systems too limiting, does this preclude voice? Can we make a statement that we hope this does not preclude integrated voice and data

NS: what is a computer system?

BC: FCC considers anything with a clock of some rate which must be approved under some reg

LV 1) page 70 15.253 a) we would like to point out that we would expect to see hybrid devices with voice and data and we would not like to see that type of device to be excluded

There was a consensus that this coment should be made

LV: next section is on emission limits testing

Don Johnson (DJ): near bottom of page 70, it states peak power in a bandwidth over a second

There was much discussion, no one seemed to know what the FCC ment for the measurment of peak or average ect.

2) Power measurement confusion between 15.253 b(1)(iv), 15253 b(5), 15.253 b(4) and 15.253 d(3)

LV: should we specify how we want power emmision to be specified

DJ: it would be good to have a smooth in power spectral density function

LV: statement could be:

We think that on objective to write a spec requiring a degree of smoothness in power spectral density function is good. We are confused by current measurements specified

There was some discussion to state:
 We suggest power measured at antenna connector?
 However no consensus was reached

1.5 mw makes 1 watt less than it is if

There was some discussion on wording which would allow FCC to change the measurement which might invalidate 802.11 effort to guarantee interoperability based on general guidelines which result in an interference profile. Confusion if wording was intended to allow changing measurement techniques for new modulation or to correct errors by FCC or if it allows FCC to issue variance to new products which did not conform.

It was noted that power per megahertz decreases in various bands

.5w/MHZ in 1910-1920 10 MHz channels
 .2w/MHZ in 1920-1925 100KHz channels
 .08w/MHZ in 1925-1930 1.25 MHz channels

There was no apparent reason for this, unless they were trying to assign a watt for each service.

Tolerance on center frequency seems to tight for reasonably priced clocks. Statement for FCC could be

We would recommend that if frequency stability is to be specified it should be different for different bandwidth channels.

There was some feeling that this whole section could be removed since there is a spec that you need to stay within your band.

50 dB down at band edge is very restrictive. Possible 2 or 3 bandwidths out. Envelope top or peak as reference point?

Discussion indicates that 20 dB could be reached with simple modulations, tighter will need partial response or very tight filters

In 1920-1930 a listen before talk is specified
 LV: this will reduce spectral efficiency
 DG: this is not really a listen before talk, but a listen before occupy channel since these are intended for isochronous services

Spectral efficiency was discussed next there is a power component in their spec. There seems to be that you can use more power if you modulate at a higher bits/Hz. What units are these?

$$\frac{\text{bits/sec}}{\text{joules/sec} \cdot 1/\text{sec}} = \frac{\text{bits} \cdot \text{sec}}{\text{joule}} = \text{bits/watt} \geq 10$$

This constraint is effectively the power limit constraint rather than power limit. We need definition of what power and where data rate is measured

To use 1 watt require 10 bits/Hz. Since no one will probably modulate this way, 1 bit/hz will limit power to 100mW. This constraint encourages implementations with higher bits/Hz since it allows them more power.

Ultimate measure of efficiency could be MBits/sec/hecter/floor/Hz

Discussion of whether to move this section to the power spec section, or to remove it

It would be nice to have a power level below which an intentional radiator does not need to do adaptive power control. We would suggest 100 mW.

LV: There has been much effort by CDMA people convincing that adaptive power control is good for increasing density of users, so stating that adaptive power control should be eliminate will be difficult to get accepted. It is difficult to determine if adaptive power control will use more battery power or less.

It is felt that consensus will be difficult to reach, the rest of the group (mac) should be included. Maybe we should not respond on anything we don't have consensus, but then we might not have any response.

Some members felt that adaptive should be removed completely.