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ATTORNEYS AT LAW

December 23, 2003

Delivered Electronically

Mike Marcus
Office of Engineering & Technology
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

Re: Further Consideration of Interference in the 70/80 GHz Band
(WT Docket No. 02-146)

Dear Mike:

At our recent meeting, you asked Cisco to provide a more detailed explanation of the assumptions that were used to conduct the Monte Carlo simulation on the benefits of path coordination. In addition, we thought we would take the opportunity to sharpen one of the points that we now understand a bit better in light of our very productive meeting on Dec. 11 – namely, the question whether 36 dB should function as a maximum or a minimum for purposes of the rules. We address both topics in this letter.

First, the simulation results about which you asked appear on slide 5 of the presentation we submitted with our December 12 *ex parte* notice. As noted on the slide itself, we sought to model a hub-and-spoke deployment, and for this purpose we spaced terminals at the hub end of each link uniformly around a circle with a radius of 10 meters. Each link was assumed to be operating on a dual-band FDD basis, fully occupying both the 71-76 GHz and 81-86 GHz bands. We assumed a link budget that is given in Appendix A to this letter, and then generated random path lengths that ranged between 100 meters and the maximum path length that could be achieved in rain given the link budget. Both faded and unfaded simulations used the same distribution of path lengths. All links were assumed to be equipped with transmit power control with a dynamic range of 28.8 dB, and were assumed to operate in such a way as to ensure that the required C/N was no more than 10 dB above the required SINR unless further reductions in power would be beyond the dynamic range of the transmitter.

As the slide reveals, we simulated the percentage of failed links for hub-and-spoke deployments of up to 35 links at the same hub. For each number of links between 1 and 35, we generated 100 different random deployment scenarios, then counted the number of failed links across all 100 iterations; a link failure was counted when the SINR required for the link could not be maintained—either in clear air or rain faded. To model the results in the absence of coordination, we left both the polarizations and the assignment of transmit and receive

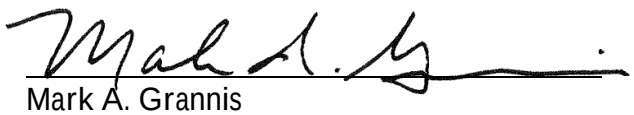
frequencies random. By contrast, the "coordinated" results assume that all links at the hub transmit on the same frequencies and receive on the same frequencies, and that adjacent links use opposite polarization. As the simulation results show, interference is a much greater problem during precipitation than during clear-air conditions and ATPC is the most effective way to mitigate interference once proper coordination has occurred. We hope this fully answers your questions regarding the simulation, but please let us know if there is any further information you would like.

The second issue we would like to address here is whether the 36 dB D/U ratio adopted in new section 101.147(z) is properly a maximum or a minimum. This part of our discussion came late in the meeting and was therefore brief. At the conclusion of the meeting, there was much to support the view that the question was strictly a semantic one. Specifically, everyone seems to understand and agree that no link should have any right to be protected above 36 dB C/I; in that sense 36 dB is a maximum. On the other hand, what became clear to us during the meeting is that the Commission believes at least some "victim" links should be permitted to object to any new link that will reduce their C/I to below 36 dB; in that sense, the number can be conceived as a minimum. Thus, the 36 dB figure functions as either a minimum or a maximum, depending on context.

But while this issue surely has a semantic element, there is at least one respect in which a difference of real substance may be involved: namely, what happens if coordination shows that the new link would reduce the old link's C/I to 20 dB (for example) but the old link would not suffer harmful interference at that level. The language submitted by the industry in the *ex parte* letter filed September 30, 2003 would have placed the 36 dB limit in section 101.105 (governing interference criteria), in which context it would be clear that each link gets only what it needs, but no more than 36 dB. We are concerned that the Commission's alternative approach, placing the limit in section 101.147(z), protects every link at the 36 dB level whether it needs it or not, unless the victim link agrees to less protection. Because we expect the vast majority of early and mature deployments in these bands to use digital modulation, particularly in densely populated areas, we believe this will substantially overprotect many links, possibly giving first movers unneeded and unwarranted preemption rights.

Thank you once again for the time you have invested in these important issues, and please let me know if there are any further questions we can answer. I am filing the Secretary's copy of this letter via ECFS to satisfy section 1.1206(b).

Respectfully submitted,



Mark A. Grannis

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Link Budget for Simulation

Carrier Freq (GHz)	71
Transmit Power (dBm)	31.8
Tx Antenna diameter (deg)	**0.58**
Antenna boresight gain (dBi)	50.0
EIRP (dBm)	81.8
Bandwidth (MHz)	1000
NF (dB)	8
Noise Power (dBm)	-76.0
Rain Region	K
Rain Availability	0.9999
Rain Attenuation (dB/km)	16
Oxygen Attenuation (dB/km)	1
Max Path length (km)	**3.1**
Received Antenna gain (dBi)	50.0
Received Power (dBm)	-61.0
Received C/N	15.0
Required SINR (dB)	14
Interference Margin (dB)	1
Link Margin	0.0