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April 9, 2003

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street SW
Room TWB-204
Washington, DC 20554

Re: Notice of Ex Parte Communication
*In the Matter of Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and
92-95 GHz Bands, WT Docket No. 02-146, and Loea Communications
Corporation Petition for Rulemaking, RM-10288*

Dear Ms. Dortch:

On Wednesday morning, March 19, 2003, Louis Slaughter, Jay Lawrence, Tom Wetmore, and I met on behalf of Loea Communications Corporation with the following staff members of the Wireless Telecommunications Bureau: D'Wana Terry, Ramona Nelson, Herb Zeiler, Scot Stone, Jennifer Burton, and Gerardo Mejia (all from the Public Safety and Private Wireless Division); and Shellie Blakeney (from the Office of the Bureau Chief) and Tom Stanley (from the Policy Division). Michael Marcus from the Office of Engineering and Technology also attended. At that meeting, the staff posed a number of questions that required further elaboration. Our responses to questions on technical issues are attached.

The staff also posed a series of questions concerning the details of Loea's proposed blanket licensing and path coordination process, including coordination with federal government users. Loea continues to believe this proposed process best serves the public interest in bringing innovative upper milliwave band services to market. We are now fleshing out the details of this proposal internally and with other interested parties. We especially want to meet with officials in federal agencies to obtain their input. As soon as we complete these actions, we will provide you with responses.

Pursuant to the requirements of Section 1.1206 of the Commission's rules, I am filing electronic copies of this notice for addition to this docket and petition.

Respectfully submitted,



Thomas Cohen

Enclosure

CC: D'Wana Terry (WTB – Public Safety and Private Wireless Division)
Ramona Melson (WTB – Public Safety and Private Wireless Division)
Herb Zeiler (WTB – Public Safety and Private Wireless Division)
Scot Stone (WTB – Public Safety and Private Wireless Division)
Jennifer Burton (WTB – Public Safety and Private Wireless Division)
Gerardo Mejia ((WTB – Public Safety and Private Wireless Division)
Shellie Blakeney (WTB – Office of the Bureau Chief)
Tom Stanley (WTB – Policy Division)
Michael Marcus (OET)

**RESPONSES FROM LOEA COMMUNICATIONS CORPORATION
TO QUESTIONS POSED BY THE FCC STAFF
AT THE MARCH 19, 2003 MEETING**

Question 1:

When will transmission paths suffer from unacceptable interference, particularly in hub and spoke deployments?

Response:

Cisco modeling shows that with 40 dB of Transmit Power Control dynamic range on all radios, a hub with 60 spokes separated by 6 degrees will experience only 5% of link failures (3 failures) in very heavy rain (where the more distant transmitters are operating at their maximum transmit power of 7 Watts). In practice, the 3 affected deployments would be identified during the coordination process and only 57 spokes would be deployed. With only 30 dB of TPC dynamic range, this number of non-interfering spokes drops in half to about 25. (Please contact Cisco for documentation of this modeling.) After much discussion, the Wireless Communications Association (WCA) reached a consensus requiring only 32 dB of TPC range at max power (+55 dBW), but added an absolute power level limit that would effectively push the number of non-interfering spokes to over 60.

Question 2:

In Loea's comments, it argues against any unlicensed use in these bands for a variety of reasons, including the importance of providing assurances of non-interference required by customers. Can you please explain your conclusion more fully as it applies to unlicensed in-building use?

Response:

A typical MMW wireless receiver noise floor will be -107 dBW (thermal noise in 5 GHz noise bandwidth) + 7 dB (Receiver Noise Figure) = -100 dBW. To get another 6 dB of cushion against interference, the power level from non-licensed transmitters must be -106 dBW, for a PFD of -143 dBW/m²/MHz. However, determination of PFD requires foreknowledge of the placement of non-licensed transmitters relative to licensed receivers, which is impossible because licensed transmitters may be placed *after* unlicensed devices are in operation, and a coordinator cannot know where these unlicensed devices are located. Moreover, Loea has already demonstrated in its New York City and Silicon Valley (WCA Conference) trials that there is usefulness in placing radios inside of buildings for transmission through windows. Thus, even a very low transmit power limit on unlicensed devices in offices environments would prove problematical.

Another approach could use the concept of interference temperature to increase allowed PFD by 6 to 10 dB relative to that specified above, but the problem of spatial coordination remains when the locations of potential interferers are unknown. In short, the 60 GHz band is simply a better technical solution for unlicensed devices – oxygen

absorption is negligible (far less than 1 dB) in the office environment, the contiguous available bandwidth is greater (7 GHz from 57-64 GHz), V-Band devices can be made with standard, low-cost 0.18- μ m photolithography techniques, and Bluetooth-type transceivers have already been developed in Japan (by NEC and others) for the band.

Question 3:

What information is required for the coordination of path links?

Response:

In its comments, Comsearch argued that endpoint precision of one-tenth of an arc-second (+/- 3 meters) is desirable (but not necessarily “needed”) for proper coordination of E-Band wireless links. GPS with a Wide-Area Augmentation System (WAAS) gives this level of accuracy in latitude and longitude but not in elevation. A laser rangefinder can give height above ground level (AGL) but not true elevation relative to sea level. On the other hand, if you have x and y to within 3 meters, the height above ground level is unambiguous. In other words, any two applications with the same x and y location will be referring their height coordinate to the same ground level.

Loea understands the need for precise coordination since for a link distance of only 150 meters, the beam diameter to the 1.2-degree radiation mask edge is about 6 meters and a non-cooperative receiver could be placed less than 10 meters away. At the same time, some commenters had concerns that any FCC mandate of specific requirements to achieve this precision would result in an additional cost of installation incurred by the necessity for surveyor’s equipment and specialized GPS receivers. The WCA and Cisco proposed that these competing concerns be balanced by using conventional GPS for site coordination in general cases, and in special cases where potential interference is indicated and further coordination is required, by having the coordinator ask a new applicant to provide a higher level of accuracy, both for the endpoints and for those of the existing link with which it might interfere. If the FCC believes this proposal is not workable, Loea is open to discussing alternative requirements for more precise measurements.