

(202) 828-0155

December 5, 2001

**Via Electronic Filing**

Ms. Magalie R. Salas  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, D.C. 20554

**Re: Oral Ex Parte Presentation  
ET Docket No. 98-153**

Dear Ms. Salas:

Yesterday, Don Brittingham of Verizon Wireless, Jim Bugel of Cingular Wireless, David Wye of AT&T Wireless, and myself on behalf of QUALCOMM (collectively referred to as the "Wireless Companies") had a conference call with Peter Tenhula, Senior Legal Advisor to Chairman Powell, to discuss the above-referenced proceeding. In the conference call, the Wireless Companies reiterated their concern about significant harmful interference to existing commercial mobile wireless systems from ultra wideband ("UWB") devices and networks. We reiterated that the tests conducted jointly by Sprint, Time Domain, and Telcordia and the tests conducted by QUALCOMM demonstrated such interference, which would cause blocked calls, reduced network capacity, and degraded network performance. We explained that it would be extremely difficult for the Wireless Companies to mitigate such interference, and any such mitigation, if possible, would be very expensive. In addition, we expressed concern over interference from UWB networks and devices to E911 wireless service, a mandatory safety-of-life service that the Commission has made a high priority.

In the call, we explained the Wireless Companies do not oppose the operation of UWB devices, but merely ask that such operation not interfere with existing services provided by wireless operators over licensed spectrum. We stated that there are certain UWB applications/devices that can be authorized now with appropriate technical rules (for example, ground penetrating radar below 1 GHz and automobile collision detection devices at 24 GHz). We would not oppose unlicensed UWB communications systems operating above 3.1 GHz (that is, if the systems operated entirely above 3.1 GHz, not just with a center at 3.1 GHz). We explained, however, that given the harmful interference from UWB devices identified in the tests of the impact of UWB devices on commercial mobile wireless systems and on other important radio systems, we agree with those who ask that the Commission not authorize UWB devices to

operate at all in the 1-6 GHz range until additional testing can be conducted to demonstrate that such devices would operate without causing harmful interference to any existing radio system. We also told Mr. Tenhula that the Wireless Companies would cooperate in completing such additional testing on an expedited basis.

The attached paper by Cingular Wireless summarizes its position on the issues in the UWB proceeding, some of which were discussed in the call with Mr. Tenhula, as set forth above.

Respectfully submitted,

/s/Dean R. Brenner

Dean R. Brenner

Attorney for QUALCOMM Incorporated

cc: Peter Tenhula, Esq.

# ULTRA-WIDEBAND (UWB)

ET Docket 98-153

## **The Record Shows the Need for Caution regarding UWB**

- Cingular agrees that UWB technology holds promise; however, the Commission must not put at risk existing radio services which all Americans depend on for communications related to safety, personal convenience, and business, merely because of the potential benefits of a new and untried technology.
- The majority of studies to date have shown that there is an interference concern with UWB and that the effects of multiple UWB devices are additive. NTIA reported that “operations of UWB devices below 3.1 GHz will be quite challenging” (NTIA Special Publication 01-43). At least one of the UWB proponents has also agreed with this viewpoint.
- The promises of greater spectral efficiency have not yet been demonstrated. Is there a reason to promote UWB technologies for widespread deployment if there is not a clear gain over existing Part 15 technologies, such as Bluetooth, IEEE 802.11a/b, etc?

## **Cingular’s Concerns**

- Cingular is concerned about the impact of UWB devices:
  - UWB devices would potentially interfere with base station and handset receivers used in cellular/PCS systems having a negative impact on receiver performance. Effects could include cell shrinkage, coverage holes, degraded voice quality, and decreased throughput of wireless data. Even UWB devices that are limited to indoor use could potentially interfere with cellular/PCS/GPS receivers used indoors.
  - UWB will impact GPS for both location and network synchronization. Assisted-GPS systems would be even more susceptible to interference. Additional analysis is clearly warranted to protect these vital systems.
  - UWB could interfere with other radio systems including public safety communications systems, entertainment systems, mobile satellite services, military systems, etc.
  - UWB could also interfere with non-RF based systems including hearing aids, pacemakers, implanted defibrillators, and other hospital equipment. This is clearly a concern for UWB devices used indoors.
- Various UWB devices have signal characteristics that are very different from one another, not all of which have been studied or identified. The characteristics of all types of UWB devices must be considered and rules adopted accordingly. Similarly, if UWB devices used for wireless networking applications will be interoperable, a standard waveform and modulation must be defined and adopted by the industry.

- The additive nature of multiple types of transient waveforms needs to be examined in much greater detail, including additional measurements as well as detailed numerical simulations. Fundamentally, the signals emitted from multiple transmitters will have an additive effect, thus raising the noise floor in affected receivers.

## **Recommendations**

- Limit UWB devices to spectrum above 6 GHz for most systems and below 1 GHz for ground penetrating radar systems, or other remote sensing applications.
- The operation of UWB devices should be licensed, or at least coordinated, so that any interference issues can be examined as additional UWB systems are deployed. Conventional licensees and other users of UWB technology need to be able to determine who is using UWB devices and where they are located. This will help UWB systems to avoid causing interference and will enable others to be able to track any interference that occurs.
- Identify specific categories of UWB devices and establish proposed rules for licensing these categories based on individual waveforms, power levels, and deployment scenarios. These proposed rules should be sent out for public comment.
- The OET should consider developing a standard, detailed, measurement procedure to be used for testing UWB systems. This should help to ensure that all UWB devices are evaluated in a consistent manner.
- Identify areas where further testing is needed, including the additive effects of multiple UWB devices and multiple types of UWB devices.