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FEDERAL COMMUNICATIONS COMMISSION

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20th October, 1998

Federal Communications Commission
Attention: Magalie Roman Salas
Office of Secretary
1919 M Street N.W.
Room 222
Washington D.C. 20554

Ref: NOTICE OF INQUIRY
In the matter of: *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems.*
ET Docket No. 98-153
Adopted: August 20, 1998
Released: September 1, 1998

Dear Sir or Madam:

On behalf of UltraPulse Communications, Inc. ("UCI"), I thank you for the opportunity to comment on the proposed revision of Part 15 as it respects UWB transmission technology. UCI is a company which is set up to develop UWB transmission systems for commercial use. I am the principle engineer of UCI and hold a U.S. patent in the area of UWB communications. In your release and request for public comments, I noticed that Time Domain, Inc. was one of the parties requesting waivers, for the purpose of public safety communications.

In general, granting waivers to particular parties for their commercial use is contrary to the spirit of Part 15 and because spectrum is limited, would tend to establish private monopolies of a public resource. Time Domain has estimated the number of radio receivers for public use at 2,500, but this number is not a realistic estimate of the market. One can assume that Time Domain set this number in the hopes of convincing the FCC that interference to other users would be minimal; what appears to be proposed is that 2,500 units be permitted and that Time Domain have rights to all 2,500. Should that request for waiver be granted, Time Domain would then have a monopoly which it would enforce by claiming that any other user would raise the overall level of interference to an unacceptable level.

Spread spectrum wide band time hopping communications appears to a fixed narrow-band frequency user as a slight interference, because the energy per frequency slot (as opposed to the aggregate energy for the total frequency band) is extremely low when compared to the energy per frequency slot used in narrow-band communications. Furthermore, for properly chosen sets of frequencies at a properly narrow time-slice, the interference is not only sporadic, but is both so narrow in time and so asynchronous, that a superheterodyne receiver will reject it in the front end. Interference will become a problem only when (1) the particular narrow frequency is used by the spread spectrum systems for a time sufficient to cause heterodyning; or (2) when the spread spectrum pulses are permitted to be overly wide or of such amplitude as to overload the receiver's front end. Either of these can be controlled by proper system design, and should be addressed by a rule-making

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process which limits the approved transmitters on interference. They should not, however, be addressed by a waiver process which grants one commercial enterprise (or several) a waiver on the theory that there won't be very many of these devices anyway.

The advantages of UWB communication for public safety users include reduction in multipath, improved reliability in high-noise environments, and the ability to directly transmit information at data rates approaching the theoretical limits for a given spectrum slice. That is, UWB communications at a given total ERP would be significantly less noisy and more reliable than single-frequency communications. Because of that, there would be an immediate and very high demand for such systems. The estimate of 2,500 users is low by at least a factor 100, even among public safety users only. Should one company have, by reason of a waiver of otherwise applicable rules, a monopoly in this area, then competition would be stifled and that one company would be enriched. The monopoly would be strengthened by granting a waiver for a limited number of devices, just as a city which grants only a limited number of taxi medallions drives the private market price for a single medallion into the thousands of dollars (although the city receives only a few dollars for each).

For that reason, the FCC should either (1) propose and pass rules governing the use of UWB devices which apply to all companies equally; or (2) in granting a waiver, make it clear that the waiver is for a limited time only (perhaps one year) and make it clear that a prior waiver will have no priority whatsoever when it is time for renewal. It is our view that the first alternative is preferable, as the concept of establishment of private title and private right to spectrum is well entrenched in radio communications, and therefore the second alternative is likely to engender expensive lawsuits by prior waiver holders against the FCC and against potential competitors for failure to renew a waiver, regardless of the language used in the waiver.

We believe that UWB technologies are superior to traditional AM and FM fixed-frequency modes of transmission. Therefore we believe that the FCC should encourage them. However, we request that this be done through rulemaking, limiting the allowable interference through exacting technical specifications, and not through waivers. Should the FCC nevertheless determine to grant waivers to private users, these should be narrow in scope, non-renewable, non-priority for past holders, and explicitly limited to small geographic areas so that other competitors can enter the market. No other approach will prevent the establishment of a few private monopolies.

Thank you for the consideration of these points.

Sincerely yours,

Terence W. Barrett, Ph.D.