



School of Engineering

Department of Electrical Engineering
and Computer Science

Communication
Sciences Institute

February 12, 2003

Federal Communications Commission
Office of Engineering and Technology
445 12th Street SW
Washington DC 20554

Dear Sirs:

November 16, 2002 was the third anniversary of the experimental license WB2XAM at the University of Southern California. Accordingly I am submitting with this letter a brief report on our activities over the past year.

Sincerely,

A handwritten signature in black ink, which appears to read "R. Scholtz", is written over the typed name.

Robert Scholtz
Professor

Report to the Federal Communications Commission

from Robert Scholtz, University of Southern California

Experimental License WB2XAM

November, 2002

During the past reporting period the number of UWB propagation measurements has declined significantly. There are several reasons for this: (1) The graduation of students with measurement-based theses, (2) the availability of an anechoic chamber for measurements in a controlled environment, and (3) the issuance of the FCC Report and Order on UWB Regulations. The following report details a few of our current activities that may be of interest to you.

Filling the FCC Mask

Because of the very weak signals that UWB radios are required to use, the design of these radios requires using every possible means to efficiently move power from the UWB transmitter to the receiver. Current technologies with which we are familiar do not come close to achieving the maximum power allowed under FCC regulations. I would be surprised if the effective transmitted power currently comes within 6 dB of the maximum allowed EIRP in the 3.1 to 10.6 GHz band.

One of our efforts is to see how close we can come to achieving this EIRP for a prescribed antenna in the direction of its maximum gain. We are attempting to build a flexible UWB signal generator that can drive a specified antenna to create the electric field intensity in space that comes as close as possible to FCC allowable power densities. We view this as a desirable piece of UWB test equipment for our lab. Discussions with Pico-Second Pulse Labs and Agilent indicate that they do not yet have signal generators with the desired capability.

Equipment Upgrades

Currently we are not equipped to radiate signals in the 3.1-10.6 GHz band specified by the FCC for UWB communications equipment. Working in this range will require us to replace pulsed antennas. This has not yet been done. The few indoor measurements that we have made this year are being used as inputs to proof-of-principle simulations for receiver algorithms that we are designing.

Availability of Measurements on the Web

It should be noted that our web site (enhanced by donations from Intel and Microsoft) has a data base of UWB measurements that can be used by all interested parties. To view this, go to the Ultra Lab web site (ultra.usc.edu/New_Site/) and click on the subpage "UWB DATABASE." We expect the value of this resource to grow as more data is posted.