

ORIGINAL

*Wiley, Rein & Fielding*

ORIGINAL

1776 K Street, N.W.  
Washington, D.C. 20006  
(202) 719-7000

David E. Hilliard  
(202) 719-7058  
dhilliard@wrf.com

Fax: (202) 719-7049  
www.wrf.com

EX PARTE OR LATE FILED  
January 7, 2000

Ms. Magalie Roman Salas  
Secretary  
Federal Communications Commission  
445 12th St., S.W.  
Washington, DC 20554

Re: **Ex Parte Notification**  
ET Docket No. 98-153  
Ultra-Wideband

RECEIVED  
JAN - 7 2000  
FEDERAL COMMUNICATIONS COMMISSION

Dear Ms. Salas:

This is to note that on January 6, 2000, Ralph Petroff, President and Chairman of Time Domain Corporation, Paul Withington, Vice-President and Senior Technologist, of Time Domain, Jeffrey Ross of Patton Boggs, and I met with Julius Knapp, Chief of the Office of Engineering and Technology's Policy and Rules Division, Karen Rackley, Chief of OET's Technical Rules Branch, and John Reed, Senior Engineer of the Technical Rules Branch.

We urged the Commission's staff to move forward with the production of a draft notice of proposed rulemaking and expressed Time Domain's preference that any such NPRM generally rely on the emissions limits now used for Class A and B digital devices while recognizing that some applications may call for revised levels as the result of testing. With regard to testing, we reiterated Time Domain's view that it would be preferable for testing to be conducted at a government laboratory. We also noted that simply changing the center frequency to avoid the bands listed in Section 15.205 would not be appropriate for all UWB applications because of propagation characteristics and that inevitably there would be some residual energy in these bands. Copies of the materials left behind are attached to this notification.

Should any questions arise concerning this matter, please contact me.

Respectfully,

David E. Hilliard  
Counsel for Time Domain Corporation

cc: Messrs. Knapp and Reed, Ms. Rackley (w/ enclosures)

No. of Copies rec'd  
List A B C D E

051



U.S. Department  
of Transportation

**Federal Aviation  
Administration**

800 Independence Ave., S.W.  
Washington, D.C. 20591

DEC 22 1999

xc: → Elec Com

Mr. Ralph Petroff  
President and Chief Executive Officer  
Time Domain Corporation  
Cummings Research Park  
6700 Odyssey Drive  
Huntsville, AL 35806

Dear Mr. Petroff:

I would like to thank you for your letter dated October 12, 1999. This letter is my attempt to address the issues raised in that letter and those in our subsequent telephone conversation on October 22, 1999.

We fully support the Federal Communications Commission (FCC) plan to complete a rulemaking that addresses the ultra-wideband (UWB) technology regulatory issues, and the associated electromagnetic compatibility (EMC) testing before the end of the calendar year 2000. As you know, the issue with which we are most concerned is the potential for electromagnetic interference from UWB emissions to the operation of aeronautical radionavigation aids, which are certified by the Federal Aviation Administration (FAA) for use by aviation.

For example, the frequency band in which Global Positioning System (GPS) operates is jointly regulated by the FCC and the National Telecommunications and Information Administration (NTIA). NTIA will be working with the FCC in developing the UWB EMC test plan and rulemaking in the context of compatibility with the Global Navigation Satellite System, of which the GPS is an integral part. This important spectrum issue must be worked through the regulatory process, therefore, the FAA will work with NTIA and FCC to develop a national policy on UWB technologies. Towards this goal, the FAA will support NTIA's testing and rulemaking efforts.

I hope this clarifies the FAA position. We appreciate your continuing interest in aviation safety and hope that we share the goal of ensuring that UWB technology is implemented without degradation to the safety of our Nation's airways. Please feel free to contact me at (202) 267-9710 if you have any additional questions.

Sincerely,

  
Gerald J. Markey  
Program Director for Spectrum  
Policy and Management

[ COMMUNICATIONS ]

# Larry Fullerton

*Seeing through walls, tracking down your car*



**Born:** Dec 11, 1950, Fayetteville, Ark **Education:** B S E E , University of Arkansas  
**Role models:** inventors like Edison and Marconi **Proudest accomplishment:** winning a gold medal in the high jump in high school **Favorite book:** *Atlas Shrugged* **Chief dislike:** "Bureaucracy is way up there " **Favorite pastime:** astronomy "Galaxies are my favorite "

**BY AVERY COMAROW**

**A**s a teenage ham radio operator more than 30 years ago, Larry Fullerton would try to squeeze his pipsqueak of a signal into the crowded frequencies assigned to hams. He was routinely muscled aside by beefier transmissions from operators who could afford high-powered equipment. All the boy could do was prowl for vacant spots, slivers of spectrum the bullies had overlooked.

In the decades since, the battle for spectrum space has moved far beyond skirmishes among radio enthusiasts. Most of the radio spectrum has been given away or auctioned off by the Federal Communications Commission. The ex-

plosion of pagers, cell phones, and other telecommunications services, as well as advanced government and military systems that use radio waves, has generated intense competition over the remaining scraps.

The Internet is worsening the crunch. By some estimates, tens of billions of computers and other "Internet appliances" will be connected to the Net in five years or so. There won't be enough fiber-optic cable hooked up to carry all that data. If even a small percentage of the new traffic is funneled through satellites and other wireless devices, they will need frequencies from somewhere in the radio spectrum.

And that's where Fullerton, now founder and chief technology officer of Time Domain in

Huntsville, Ala., re-enters the picture. The engineer, who came to Huntsville in 1979 to work for NASA but left because he "ran into miles of red tape," has designed a circuit that may ease the squeeze through the use of "ultrawideband" (UWB) technology. The design is etched into high-speed chips that blend silicon and germanium. Fullerton overflows with large and small ideas for chip-based products. One prototype device, called RadarVision™, is a portable radar about the size of a ream of typing paper that can see through walls and detect very small movements. That means it could locate people trapped in the rubble of collapsed buildings and earthquakes. A cheap wireless home telecommunications network and a gadget that can find a car lost in a parking lot also are in the works.

**Data hiccup** In Fullerton's scheme, digital data are not transmitted on a single frequency or small band of frequencies, as is typical. Rather, information is sent as a pulse half a billionth of a second long across a wide swath of the spectrum already used by global positioning systems, military satellites, and commercial radar (1 to 3 gigahertz).

Fullerton would sidle unnoticed into the throng by transmitting at extremely low power—no more than 50 millionths of a watt, or less than 1/10,000 the punch of a cell phone. Devices equipped with Fullerton's chip could read the data hiccup, but to conventional communications equipment it would be lost in the background noise. Multiple ultrawideband devices could operate in the same room, because the coding of the pulsed information would be unique to each product.

As RadarVision demonstrates, the ultrawideband pulses also penetrate thick layers of concrete as if they were tissue paper. Integrating the chip into cell phones would allow co-workers to talk with each other within a building, which isn't always possible now.

Fullerton has plans for a \$30 home network that would link computers, TVs, wireless phones, and other appliances without wires or cables, and an ultrawideband "tag" that would pinpoint a car in a sea of vehicles parked at an airport or stadium. He wants such products to be affordable—\$5 to \$100. Several should be poised for delivery by next Christmas.

Whether they will be under the tree depends largely on the FCC, which will have to modify its rules to allow ultrawideband transmissions. Fullerton is optimistic, and his brainchild is attracting capital. Siemens, the German telecommunications giant, put \$5 million into Time Domain in November. "I'm not so wise as to know where this will take us," says Bjoerne Christensen, president of Siemens's U.S. venture capital group. But it is an idea, he says, "that represents a truly fundamental change." ●