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Ultra-Wideband Rules Released

*By: Mitchell Lazarus
703-812-0440
lazarus@fhhblaw.com*

Two months after adopting rules for ultra-wideband (UWB) operation -- four years after the proceeding commenced -- the FCC finally released its rules to the public. And even then, the proceeding is not yet over.

Like the "spark gap" transmitters that flashed Morse Code among ships in the earliest days of radio, a UWB transmitter spreads its signal across a very wide swath of spectrum -- up to several gigahertz. But UWB works at extremely low levels. The new rules limit the strongest UWB signal at any frequency to the same minuscule level as the maximum radio noise from a personal computer -- power measured in *billionths* of watt. Operation at some frequencies is held to levels thousands of times lower.

Even with these flea-powered signals, the first UWB communications devices will operate at 10 times the data speed of existing 802.11b (Wi-Fi) networks, although at only about one-tenth the range. Even so, UWB is expected to find very wide use for interconnecting consumer electronic devices (laptops, Palm-type organizers, digital cameras, etc.), and for short-range networks, especially in the home, connecting TVs, DVD players, and cable and satellite video interfaces. A separate list of radar applications includes imaging into walls, through walls, and underground, and as collision avoidance systems in moving cars. Still other applications include monitoring fluid levels in large storage tanks, and even detecting the presence of a person on the commode to activate a bathroom ventilation system.

Given the evident public benefits and the low propensity for interference, why did the proceeding take so long? A UWB signal occupies so much spectrum that it overlays both commercial and Government spectrum, and it cannot avoid putting some energy into the sensitive "restricted bands" ordinarily unavailable to radio transmitters. Spectrum users such as GPS, PCS, and DARS feared that widespread adoption of UWB would cause the accumulation of interference into their frequencies from multiple devices. And some Government users objected as a matter of principle to allowing intentional emissions at any level into the restricted bands. The FCC responded by severely limiting UWB radiation. At some frequencies, UWB devices are held to levels 3,000 times lower than the permitted noise from a PC. The FCC also limited some types of UWB radar devices to public safety agencies, research facilities, and/or mining and construction companies, and has required some users to coordinate their operations with the Government.

Even after the long wait, the proceeding is not yet over. The FCC has acknowledged that its first try at regulating UWB may be too stringent, and has promised to reexamine the

rules soon.