

Dr. Robert J. Fontana
President, Multispectral Solutions, Inc.

Presentation Abstract

Ultra wideband – the "wave" of the future or paradigm for spectrum misuse?

Ultra wideband (UWB) technology, probably most well-known for its use in ground penetrating radar, has also been of considerable interest for communications, radar and geopositioning applications demanding various combinations of low probability of detection, multipath immunity, high data rates and/or precision ranging and localization.

Within the past couple of years, UWB has received considerable exposure in the press – unfortunately, much of it stemming from controversy over the potential impact of allowing unlicensed use of UWB in restricted bands (under FCC Part 15) on the integrity of existing systems designed for safety-of-life, safety-of-flight (e.g., Global Positioning Satellite), PCS/PCN and military applications. Most likely, by the time this paper is presented, the FCC will have issued its first Report and Order on this subject (ET Docket 98-153).

The intent of this paper is to attempt to separate "fact from fiction" from the perspective of a UWB hardware developer with a 17 year history of developing and fielding UWB systems. After a short introduction to the history and theory of ultra wideband technology, we describe the current state-of-the-art in this emerging field, and provide detailed descriptions of some recently fielded UWB hardware and equipment. This will allow us to examine the reasons why some proposed commercial UWB systems can indeed cause interference to existing systems, and to suggest strategies (both technical and regulatory) for mitigating this interference. Finally, a summary of where UWB research will be heading in the next few years will be presented.