

Biosystems and Agricultural Engineering Update



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GPS in Jeopardy?

Could the LightSquared proposal to the FCC knock your GPS off the air?

It appears that even a bulwark such as GPS can be put in jeopardy if somebody is not watching. Over the last several months, there has much talk in the GPS world about a recent proposal from a company called LightSquared to the Federal Communications Commission (FCC) to establish a national broadband internet system. While this is a noble effort and the principle represents a potential boon to rural America, the technical implementation plan as proposed will likely have a catastrophic impact on the agricultural, construction and surveying communities throughout our country that rely heavily on high precision GPS technology.

What is the proposal?

LightSquared has made a request to the FCC to use a certain frequency band for land-based broadband communications similar to current cellular signals and recognized by many as 4G LTE. This frequency band, which is adjacent to one of the GPS satellite broadcast frequencies, had previously been used for satellite communications - in particular the Omnistar and Starfire signals familiar to many in the agricultural community. Because LightSquared is using a land-based system, they will be broadcasting at an enormously higher power level than the former satellite broadcasts in that band and the GPS satellite signals adjacent to it. Because of this sheer power on a close frequency and the fact that

most of the high precision receivers currently in use have antennas with sensitivity in the proposed band because of potential Omnistar and Starfire use, the LightSquared signals will “bleed” into the GPS frequencies either adding noise and degrading the quality of the signal or completely masking the GPS signals rendering receivers useless.

The effect on GPS receivers

LightSquared has stated that their system would only affect a small percentage of GPS receivers. Most GPS experts do not agree. The vast majority of GPS receivers in use today are cell phone or personal units used for automobile navigation and outdoor recreation, which may experience only a limited impact from the LightSquared broadcasts (although some data have shown that they too may be rendered inoperable near transmission towers). The equipment that will be most severely affected are the high precision receivers that are used heavily in agriculture, construction and surveying. Tests have shown that many of these GPS units will be rendered completely useless anywhere within about a mile or so of the LightSquared transmission towers. The GPS developers have indicated that *if* a solution could be designed to separate the signals (and many are skeptical that it could be done at reasonable cost), current users would likely need to purchase new equipment, and that the new

equipment will probably not perform as well as the current equipment they are using. In the agricultural industry, implementation of this system will be potentially devastating to anyone that relies on high precision GPS technology for variable rate application, guidance, autosteering, and automatic section control. It will be a giant step backward in our environmental protection and input use efficiency efforts of the last 2 decades. The effects would be equally devastating to the construction and surveying industries.

Status of the FCC decision

The FCC appointed a working group to look into the matter. Their report was published on June 30, 2011. The U.S. GPS Industry Council summarized the findings of that extensive report by stating that, “*Such a network would cause unacceptable interference to GPS operations, wiping out an installed base of over 500 million units used in a wide array of public safety, aviation, industrial and consumer applications.*” At this point the FCC has not rendered a final decision on the proposal, but the departure of top executives from LightSquared’s parent company subsequent to the release of the working group report may be a foreshadowing of the impending action.

Is it time for action?

Should the public take action on this matter? Awareness at this point is key. Rest assured that *many* GPS advocacy groups as well as GPS manufacturers are weighing in heavily on the issue. Should the FCC decide to ignore all of this input as well as the findings of their own working group and allow LightSquared to move forward, then it will be time for public outcry. For now, the GPS community is counting on the voices of reason and logic to win out.

If you would like to voice your concern to the FCC, you can find information on how to do it at www.saveourgps.org.

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Addendum: Proposal Denied!

In February, 2012 the National Telecommunications and Information Administration (NTIA) sent a letter to the FCC stating that “there appear to be no practical solutions or mitigations that would permit the LightSquared broadband service, as proposed, to operate in the next few months or years without significantly interfering with GPS.” This prompted the FCC to immediately issue statements that essentially forbid LightSquared to move forward with their original proposal. There will still be comment periods on this decision and inevitable appeals and legal wrangling for months or possibly years, but it is very unlikely that this proposal will come back.

While this immediate threat is over, the GPS industry has been awakened and is working on standards and guidelines for receivers and signals to insure the integrity of GPS, which is so crucial to our infrastructure.