



# Broadband vs. GPS

**B**y now you have probably read a lot about the ongoing Broadband-vs-GPS controversy (as some call it)—could this spell certain disaster for GPS? Or will this be as much of a non-event as Y2K? No one knows for certain the full impact of what will happen when the broadband provider in question throws the switch. But as various testing efforts have gotten under way, it is becoming more apparent that there will likely be some level of interference and service degradation for GPS users; just how much and how localized we will not know until the formal public tests are completed and reported to the FCC on June 15th.

Substantial interference would (presumably) prompt the FCC to act to mitigate or halt the signals. It is perhaps the potential

for very low interference that may not warrant a big enough hammer for the FCC to wield and ironically might prove to be the most troubling for GPS end users. We should examine some of the possible scenarios, but first a little background.

The root of this current panic (or concern) is the January 2011 FCC Order DA 11-133 authorizing the communications giant LightSquared to operate a new set of services and transmissions immediately adjacent the L-band in which GPS signals reside. Just on the surface this sounds rather scary, especially when concerned parties start throwing around hyper-charged statements like “the new signals are one billion times the power of a GPS signal as received on the ground”. Depending on how one computed the comparison, this might be true even if a bit off target.

>> By Gavin Schrock, LS

There is a fine line between hype or sheer panic, and measured concern (pardon the pun) for those who are increasingly dependent on GPS for their livelihood, public safety, trade or commerce. Even the layman experiences signals bleeding over where they were not intended—remember CB radios causing interference on your TV? The GPS signal is in many ways a dim light bulb in space compared to some other types of signals; the very thought of something powerful anywhere near it is frightening, and absolutely worthy of concern and examination.

Demonizing the FCC or the broadband provider is not the answer (yet). The FCC is trying to juggle the public's thirst for ever-increasing wireless Internet services within the crowded radio spectrum, and LightSquared, the communications giant granted the FCC order is simply doing business. While many find the terms of the FCC order unacceptable, allowing LightSquared to build out their multi \$B infrastructure ahead of a comprehensive study of the hazards, the order does spell out the requirement that LightSquared work directly with the GPS community on evaluation of hazards. To this end, a broad coalition has been formed, standing vigilant over the whole process—saveourgps.org. The US GPS Industry council, leading the charge, has paired with LightSquared in a working group to study the potential hazards and file monthly reports to the FCC; the final report due June 15th, 2011. Formal tests are under way in the Las Vegas area (and it is to be noted that the FAA issued a warning that these tests may affect aviation users; a standard protocol for testing of any signals close to aviation spectrum). It makes me wonder though, if LightSquared and the FCC are so confident that there will be no interference then why don't they run the tests right inside the DC beltway?

You would think that the Department of Defense would be the first to do their own tests, and they have; closed chamber tests were done in late April 2011 at the White Sands facility, and of course the results are classified (the DoD is not in the habit of advertising

vulnerabilities to any of their systems). Rumor has it though, that the tests were not promising. Indeed, language has been added to the National Defense Authorization Act, recently approved by the House Armed Services Committee which requires the Secretary of Defense to notify Congress if he determines there is widespread interference with the military's use of the GPS caused by a commercial communications service. While some supporters of the new service make the oddball argument that the military uses GPS mainly in wars far from any potential LightSquared signals (huh?) it appears the DoD has reserved a hammer to protect the military uses. What about the rest of us?

What if tests show high levels of interference for civilian uses? If GPS were to experience substantial outages, denials of service, or dramatic errors, then it is fully expected that the FCC would simply stop the new broadband services and send LightSquared back to the drawing board. The FAA, Commerce Department, DoD, DHS, ACSM, and many others filed letters of concern with the FCC. The FCC order is conditional—the FCC can revoke the authorization. No one expects the FCC to order a full stop though, chiefly because LightSquared had been allowed (and encouraged) to sink billions into the infrastructure and would more likely be expected to fix, rather than dismantle. It is pretty sad though when decisions about critical technologies are influenced more by hedge fund managers than engineers.

What about “just-enough-interference-to-irritate-end-users”? While people love their wireless Internet, bordering on flat out addiction, the true value and utility of GPS is unknown to the average consumer. If the interference is very localized, and perhaps only an irritant to a relatively small segment of end users (like surveying or precision agriculture) the FCC and LightSquared might characterize this as an acceptable loss. The lofty goal of “broadband for all” is a cause *du jour*. Indeed the new services are designed to be offered wholesale from the provider, so that third parties (like big-box chains) will be able to offer data services via very inexpensive devices

they can have built overseas. Okay, maybe our data access will get cheaper, but what if our GPS is sub-par around the transmission towers? The MOST disturbing part of this whole debate is that the FCC, or should we say the FCC chairman (as calls for a formal hearing before the full commission have fallen on deaf ears) appears to be siding with the “acceptable collateral damage” camp.

Some supporters of these new services are already spinning arguments like “a lot of GPS equipment is old and should be upgraded”, presumably to equipment that would be able to filter out the interference. Great, so we foot the bill? So we all have to adapt to this new-and-degraded GPS with little or no warning, no full hearings, and no public comment period? At least with the switch to digital television there was many years warning and even rebates on converters

Even if there is no actual documented interference, the seeds of doubt will have been planted. How many users will mistakenly attribute some instances of substandard GPS performance to these new signals? After all, there are still folks who think the military is blocking their signals when their car GPS puts them on the wrong side of the intersection... And the jockeying for spectrum adjacent to GPS will most assuredly not end with this venture.

June 15th – the report of the joint testing will give us the best insight into the potential hazards. What if the report shows that we surveyors will definitely be affected? But what if the FCC brushes this off as “The needs of the many...blah blah blah...” Then we MUST act. The best advice is to become part of one big coordinated squeaky wheel is to visit the website for the [www.saveourgps.org](http://www.saveourgps.org) coalition.

**Do not panic, but be prepared to panic!** *A*

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