Over the past few months, writes Peter Clarke, the part of the Global Navigation Satellite Systems community that uses the US Global Positioning System, has been in uproar over proposals to use for terrestrial mobile broadband a part of the L-band radio spectrum adjacent to that used by GPS.

In November 2010, US wireless broadband wholesaler LightSquared Subsidiary LLC, which has rights over the 1525–1559 MHz part of the Mobile Satellite Services microwave band, sought approval from the US Federal Communications Commission (FCC) for a modification of the Ancillary Terrestrial Component (ATC) of its proposed satellite broadband system. After a short consultation period, conditional approval was granted in January 2011.

This seemingly innocuous change could in fact have removed the last safeguard against the terrestrial jamming of GPS signals. The principal L-band of GPS, shared with the European Galileo in the 1559–1610 MHz band, is transmitted at very low power by satellites at 19.2 kHz altitude; the received power at Earth’s surface can be detected only using spread-spectrum techniques. Previous modifications to the FCC licence to LightSquared and its predecessor SkyTerra had allowed more and more powerful ATC terrestrial base stations, but kept the system principally satellite-based, ensuring that high-power ground transmissions were unlikely to affect GPS. This application seeks the removal of this limit, raising the real possibility of 40 000 to 3 000 km respectively.

In June, shortly after the publication of the results, LightSquared suggested that it would consider delaying relevant operations, which would reduce (but not eliminate) the likelihood of interference for navigational GPS receivers. It would also allow more time for all GPS users to adapt or upgrade hardware. However, this delay would be unlikely to benefit high-precision users of GPS: their higher-bandwidth carrier phase receivers would still be affected by the initial LightSquared transmissions. Interference mitigation for such receivers is a much greater challenge than for navigational GPS.

A period of FCC consultation (until July) followed publication of the results. The Directorate-General for Enterprise and Industry of the European Commission submitted a statement, raising concerns that the LightSquared system would impact receivers using Galileo, including distress beacons, that might be used in the USA. Such general receiver concerns also apply to scientific and industry users of other networks such as GLONASS wishing to use instruments in the USA. The US Department of Transport and Defense issued a joint letter expressing strong concern at the proposals. The Save our GPS coalition, formed in February, and many others contributed to the consultation.

The FCC has already asked the GPS industry and LightSquared for further information. Motions passed in the US House of Representatives in May and June prevent the FCC from authorizing LightSquared to proceed until the concerns are answered. However, GPS World magazine reports that LightSquared has filed documents with the International Telecommunications Union in what may be an attempt to circumvent the FCC. The European Commission’s concern may yet seem prescient.

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http://www.saveourgps.org
http://www.pnt.gov/interference/lightSquared
http://www.insidegnss.com
http://www.gpsworld.com
http://www.lightSquared.com

**LightSquared: a continuing threat to GNSS?**

**New service vehicle boosts ALMA productivity**

It may look like the lifts that load the in-flight meals on to an airline, but this machine is in fact a big step towards efficient operations at ALMA, the Atacama Large Millimetre Array in Chile. This first Front End Service Vehicle will service the superconducting receivers within the ALMA telescopes without dismantling the telescopes and taking them out of operation for as much as four days; FESV 1 can do the job within an eight-hour shift. Previously the whole telescope was transported 60 km from an altitude of 5000 m to the support facility at around 3000 m.

FESV 1 is insulated and equipped with everything needed to service the receivers in the harsh environment of the Atacama desert: a cryogenic compartment to keep the receivers at 4 K, telescope power supplies, air tanks, and a suite of maintenance equipment. The most specialized of these devices is a sturdy forklift trolley that can safely move an entire three-quarter-ton ALMA receiver cabinet. (Carlos Padilla, NRAO/AUI/NSF)