

**Joint Written Statement of
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Energy and Commerce Committee
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“The LightSquared Network: An Investigation of the FCC’s Role”

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Good morning Chairman Stearns, Ranking Member DeGette, and Members of the Oversight and Investigations Subcommittee.

My name is Julius Knapp, and I am Chief of the Federal Communications Commission’s Office of Engineering and Technology (OET), where I have served as an engineer for 38 years. OET is the Commission’s primary resource for engineering expertise and provides technical support to the Chairman, Commissioners, and the FCC’s Bureaus and Offices.

I appreciate this opportunity to join my colleague, Mindel De La Torre, Chief of the FCC’s International Bureau, in appearing before you today. My portion of the testimony will focus on the FCC’s role in evaluating and attempting to resolve spectrum interference issues in connection with Mobile Satellite Service (MSS) in the L-band. Ms.

De La Torre will address the process and historical context related to granting Ancillary Terrestrial Component (ATC) authority to MSS providers.

At the Commission, we are focused on ensuring that businesses and consumers are able to take full advantage of the economic opportunities presented by underutilized spectrum, but only when consistent with public health and safety. In this decade-long proceeding to remove regulatory barriers and align the service rules for the L-band with the rapid evolution of mobile communications technologies and markets, the Commission considered a unique proposal that had the prospect of attracting new private investment, increasing competition, bringing additional broadband service to rural and hard-to-reach regions, and creating thousands of jobs. This proposal was the direct result of proceedings designed to ensure that MSS spectrum would be utilized to its maximum potential.

As with any proceeding before the Commission that has a potential for spectrum interference with nearby spectrum users, the FCC relies on licensees and stakeholders to raise interference concerns to ensure the timely resolution of such complaints. During the decade preceding the November 2010 waiver request, the GPS industry had numerous opportunities – detailed below – to inform the Commission of the receiver overload interference issue ultimately raised in 2010.

Despite participating in multiple proceedings, and raising *other* interference issues that were ultimately resolved to the GPS industry's satisfaction, it did not do so. The FCC would have investigated any complaints as soon as they were raised and attempted to mitigate at that stage. Nevertheless, when GPS receiver manufacturers and service providers ultimately informed the Commission of the potential for legacy device overload

interference in the L-band, the Commission halted the licensee's proposed commercial service. To be clear, in November 2010, the GPS industry was not complaining about out of band emissions or interference caused by handsets, or the power levels authorized for the L-band – they were instead notifying us of their own receivers potentially picking up signals from the neighboring band.

In responding to those GPS concerns, the Commission acted responsibly to protect national security and public safety while simultaneously attempting to find a solution to the GPS overload interference issue. We worked equally with all interested entities, including the NTIA, DOD, other federal agencies, and the United States GPS Industry Council (USGIC) to assess LightSquared's proposal and to encourage the parties to work together to resolve this matter. The process was fact-based, transparent, and in accordance with the Commission's established policies and procedures. I stand behind the work of our engineers and other technical experts.

Spectrum Management Responsibilities and GPS Issues

Spectrum is of vital importance to our economy. It is, however, a finite and increasingly scarce resource. Accordingly, the Commission has focused its efforts on ensuring that this resource is used to the greatest degree possible to spur competition, increase investment and innovation, and create jobs. At the same time, we are dedicated to the protection of homeland security and national defense, and we recognize the needs of existing licensees to utilize spectrum for a broad range of commercial and noncommercial purposes.

The FCC and the NTIA share responsibility for managing the radio spectrum. The FCC is responsible for use of the spectrum by the commercial sector and state and local governments. The NTIA is responsible for federal government use. These shared responsibilities require that the FCC and the NTIA coordinate on such matters as the prevention and resolution of harmful interference issues. Under a 70-year old Memorandum of Understanding with the Department of Commerce, the FCC and the NTIA coordinate activities on spectrum matters of mutual interest.

The need to ensure proper coordination of spectrum resources is well known to this Committee. Last week, for instance, the Communications and Technology Subcommittee held a hearing on “Creating Opportunities through Improved Government Spectrum Efficiency.” As the Subcommittee’s hearing memorandum noted, “[u]sing spectrum more efficiently and with modernized equipment could help Federal agencies better fulfill their objectives while freeing spectrum for broadband services.” Those goals – particularly increasing spectrum efficiency and freeing spectrum for broadband services while enabling Federal agencies to fulfill their objectives – have driven the Commission’s efforts to reduce regulatory barriers for use of the L-band spectrum.

The GPS-MSS conflict involves unfiltered or poorly filtered GPS legacy devices bleeding into the spectrum of neighboring users, with the result being receiver overload. Thus, the interference at issue today does *not* result from MSS/ATC L-band users emitting signals into the GPS spectrum. Rather, it results from legacy GPS devices listening into the band next door to them. In effect, we discovered that some GPS legacy equipment effectively treats the GPS spectrum and the L-band spectrum as one band.

When faced with conflicting uses and interference complaints such as these, the Commission's engineers and technical experts have always initiated fact-based, transparent reviews of interference complaints. The Commission's goal in proceedings such as these is to foster cooperative, engineering solutions to what sometimes seem to be impossible problems. This process is dependent upon the active participation of all stakeholders and the timely reporting of essential technical information to the Commission.

In particular, the Commission relies on receiver manufacturers and service providers to report interference issues because they are best positioned to understand the parameters and limitations of their own equipment. The Commission does not possess the technical specifications for the hundreds of types of GPS devices utilized by commercial users, government contractors, and government entities. Moreover, since the FCC does not regulate GPS devices, we are not prepared to test such devices or determine their capabilities and interference issues.

Manufacturers and service providers have the relevant information, and they also have the incentive to notify the Commission of the potential for receiver overload so as to avoid problems with their services and products. The Commission routinely hears from parties that are concerned that new services will cause interference. In this instance – unlike any other that I can recall in my decades at the FCC – the GPS industry did not do so until very late in the proceeding. Once the Commission received that information, it acted quickly to prevent any public safety problems. The lack of technical data provided in response to earlier Commission proceedings prevented us from addressing that issue

until well after permission had been granted in 2003 for MSS providers to use the L-band for terrestrial service.

A Decade of Promoting Greater Use of MSS Spectrum*

A more detailed summary of the Commission's ten-year history of MSS proceedings demonstrates that the Commission consistently, across the tenures of three FCC Chairmen, worked to enable terrestrial use of MSS spectrum. This history further shows that the Commission acted in accordance with established procedures and allowed multiple opportunities for public participation. Also, the Commission staff exercised delegated authority only where consistent with Commission rules and provided at least 48 hours advance notice to individual Commissioners to inquire about these decisions.

The proceedings relevant to this hearing began in 2001, when LightSquared's predecessor-in-interest, Mobile Satellite Ventures (MSV), along with another company, ICO Global, petitioned the Commission to allow for the addition of an ancillary terrestrial component (ATC) to integrate terrestrial services with their mobile satellite services. These parties argued that the public would benefit from this terrestrial component because it would enhance coverage in locations where reliable satellite service was challenging, particularly urban areas.

Later in 2001, the Commission issued a Notice of Proposed Rulemaking seeking comment on MSV's petition and the appropriate technical rules for protecting GPS operations. The Notice specifically invited comment on the requirements necessary to protect GPS against harmful interference. In July 2002, MSV and the USGIC submitted

* Attached as "Appendix A" to this testimony is a timeline providing the complete procedural history of the MSS/ATC and LightSquared's proposal.

for the record of that proceeding, a joint agreement on emission limits into the GPS spectrum and stated that this agreement would adequately protect GPS receivers.

In 2003, the Commission approved rules to permit MSS licensees to operate up to 1,725 ATC base stations to provide mobile service to areas where satellite signals are degraded or blocked (specifically urban areas and inside of buildings). The USGIC filed a petition for reconsideration of the out-of-band emission rules, noting that the rules failed to adopt the emission limits specified in the 2002 agreement. USGIC noted that the limits were necessary to protect against the potential deployment of tens of thousands of cell towers and millions of mobile devices. Again, however, the receiver overload issue was *not* raised in opposition comments or in petitions for reconsideration or applications for review.

In 2003, SkyTerra (formerly MSV, now LightSquared) requested authority (*i.e.*, a license) to offer an MSS/ATC service. The International Bureau sought public input on this request. It again received no comments raising receiver overload interference.

In 2004, the International Bureau, on delegated authority, applied the Commission's 2003 Order on ATC authorizations to permit SkyTerra to offer an integrated MSS/ATC service to users equipped with dual-mode handsets. SkyTerra was authorized to deploy a terrestrial network using the 1,725 base stations permitted under the Commission's then-existing rules. Once again, no parties raised the overload interference issue in response to the grant of this authorization, and no parties filed a petition for reconsideration of the authorization.

In 2005, in response to petitions for reconsideration of its 2003 Order, including the one filed by USGIC, the Commission revised its MSS/ATC rules. The new rules

removed the limitation on the number of terrestrial base stations (1,725) so long as operations met certain technical parameters. The Commission also noted that MSV agreed to comply with the tighter limits on out-of-band emissions in a manner consistent with the recommendations of the USGIC and the Executive Branch (including the Department of Defense). The Commission also affirmed its commitment in the Order to coordinate any ATC authority with NTIA to assure adequate protection of the GPS. The Commission received no reports or complaints of potential overload interference following the release of this order – which had explicitly lifted the base station limit.

Between 2006 and 2008, the International Bureau granted modifications to SkyTerra MSS operations, but none of the modifications implicated its authority to deploy an unlimited number of terrestrial base stations under its ATC authority.

In 2009, Harbinger and SkyTerra filed an application for transfer of control of SkyTerra to Harbinger. SkyTerra also filed an application for modification of its MSS/ATC authorization including a request for waiver of several technical rules. The International Bureau placed both filings out for public comment. The GPS community, including USGIC, filed comments raising concerns that the existing out-of-band emission limits would be insufficient to protect indoor reception of GPS from mobile devices due to emissions from mobile devices communicating with the base stations. Once again, no party raised the separate receiver overload interference issue.

Later in 2009, SkyTerra and the USGIC submitted a joint letter to the Commission stating that the out-of-band emissions interference issue had been resolved. The joint letter did not raise the different receiver overload interference issue.

In 2010, the Commission released its National Broadband Plan. The Plan, in Recommendation 5.8.4, identified the 40 MHz of L-band spectrum (then licensed to SkyTerra) in its call for the FCC to accelerate terrestrial deployment in the MSS spectrum bands. No entity raised the receiver overload interference issue in response to this recommendation.

In March 2010, the three Commission Bureaus (the Office of Engineering and Technology, the International Bureau, and the Wireless Telecommunications Bureau) jointly issued two orders. The first of those orders granted Harbinger's request to acquire SkyTerra. That Order detailed Harbinger's plans to construct a hybrid-satellite-terrestrial network and noted Harbinger's intention to cover 90 percent of the U.S. population via the terrestrial component of its network. That Order imposed conditions on Harbinger that required it to build out this network but did not alter or waive any MSS/ATC rules. In the second Order, the International Bureau granted Harbinger's request for a modification of its MSS/ATC authorization. Again, no parties or entities raised the receiver overload interference issue in response to either of these Orders.

In July 2010, the Commission initiated a rulemaking to provide greater flexibility to deploy terrestrial service in the MSS bands, including the L-band. In September 2010, *for the first time*, the USGIC filed comments raising the possibility of receiver overload interference to GPS receivers at a distance of about 100 meters from ATC base stations. This interference would be greater for devices that did not use state-of-the-art filtering such as certain mobile consumer GPS devices. In its comments, the USGIC noted that it had worked collaboratively with the MSS/ATC operators in the past and had reached mutually acceptable agreements to avoid interference into the GPS band. USGIC also

expressed a belief that solutions would be available to mitigate the receiver overload interference issue.

In November 2010, LightSquared filed a request to modify its MSS/ATC authority further to allow sales of mobile devices that had terrestrial-only capabilities as part of an integrated MSS/ATC service. The International Bureau placed this request on public notice, and ultimately extended the comment period in response to a request for additional time. Several GPS industry participants and users objected to LightSquared's planned MSS/ATC deployment based upon the receiver overload interference issue.

On January 26, 2011, the International Bureau responded to the concerns raised by the GPS industry and other parties by preventing LightSquared from deploying commercial service in the L-band until it resolved concerns about harmful interference. The Bureau did so through a conditional waiver order that also directed LightSquared to organize and participate in a GPS interference technical working group in which all interested parties would work directly with LightSquared to resolve the interference concerns. The Technical Working Group included more than 120 participants, including representatives from the Department of Defense and other federal agencies, as well as the GPS community, various telecommunications companies, and LightSquared.

On June 30, 2011, LightSquared filed the final report of the Technical Working Group with the Commission. Based on the results of the working group's testing, LightSquared recognized that its proposed use of part of its spectrum (the "upper 10 MHz band") would result in GPS receiver overload. LightSquared offered an alternative proposal to operate only in another part of its spectrum ("the lower 10 MHz band") and to

coordinate and share the cost of underwriting a workable solution for GPS legacy precision measurement devices at risk of overload.

The FCC released the Technical Working Group's report and the alternative proposal for public comment in June 2011. After reviewing more than 3,000 comments concerning the report, in September 2011, the International Bureau and the Office of Engineering and Technology, in coordination with NTIA, released a Public Notice calling for additional testing to assess the potential for interference to GPS under the revised technical proposals.

On February 14, 2012, after that further testing, the Commission received a letter from NTIA stating that the results of the testing indicated no current, practical way to mitigate the GPS receiver overload interference issue for legacy equipment. The next day, the Commission's International Bureau issued a Public Notice seeking public comment on whether it should (1) vacate the Conditional Waiver Order, and (2) suspend indefinitely LightSquared's ATC authority to an extent consistent with the NTIA letter. The Commission staff is currently reviewing the extensive record developed in response to that Public Notice. At the current time, LightSquared cannot deploy its service commercially because of the unresolved receiver overload interference issue.

Conclusion

As we stated at the outset, at the Commission we are focused on ensuring that businesses and consumers are able to take full advantage of the economic opportunities presented by underutilized spectrum, but only when consistent with public health and safety. We are also cognizant of the underlying issue in this case concerning legacy GPS receivers and receiver standards. Accordingly, the Commission moved ahead this earlier this year to

conduct a receiver performance workshop and we expect forthcoming information. The FCC's Technological Advisory Council (TAC) is reviewing this issue and we expect a report to the Commission on this subject in the next few weeks.

This concludes our testimony and we look forward to answering your questions.