

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of)
)
LightSquared Inc. Petition For Declaratory Ruling) IB Docket No. 10-142
) ET Docket No. 11-109

**COMMENTS OF
THE CONSUMER ELECTRONICS ASSOCIATION**

The Consumer Electronics Association (“CEA”)¹ hereby responds to the Public Notice² issued by the International Bureau of the Federal Communications Commission (“FCC” or “Commission”) seeking comment on a Petition for Declaratory Ruling (“Petition”) filed by LightSquared Inc. (“LightSquared”).³ The Petition requests that the Commission “resolve the regulatory status” of Global Positioning System (“GPS”) receivers vis-à-vis LightSquared’s proposed operations in the 1524-1559 MHz Band.⁴ For the reasons set forth below, CEA does not believe FCC action is necessary at this time.

¹ CEA is the principal U.S. trade association of the consumer electronics and information technologies industries. CEA’s more than 2,000 member companies lead the consumer electronics industry in the development, manufacturing and distribution of audio, video, mobile electronics, communications, information technology, multimedia and accessory products, as well as related services, that are sold through consumer channels. Ranging from giant multi-national corporations to specialty niche companies, CEA members cumulatively generate more than \$190 billion in annual factory sales and employ tens of thousands of people.

² FCC Public Notice, *International Bureau Establishes Pleading Cycle for LightSquared Petition for Declaratory Ruling*, IB Docket No. 11-109, ET Docket No. 10-142, DA 12-103 (rel. Jan. 27, 2012).

³ LightSquared Inc., Petition for Declaratory Ruling, IB Docket No. 11-109, ET Docket No. 10-142 (filed Dec. 20, 2011) (“Petition”).

⁴ *Id.* at i.

I. INTRODUCTION

CEA applauds the Commission's continued efforts to make additional spectrum available for mobile broadband services.⁵ As the demand for wireless services continues to grow exponentially, the availability of additional spectrum and the efficient use of limited spectrum resources are critical to meeting consumer demand.

In light of recent events, however, the Commission should not move forward with the instant proceeding. In essence, LightSquared is asking the Commission to take action based upon LightSquared's assertion that GPS receivers have been inadequately designed and thus inhibit operations on adjacent spectrum. Despite LightSquared's Petition, Congress has recently required the Comptroller General of the United States (the "Comptroller"), and not the Commission, to conduct a study regarding receiver performance and the associated effect on adjacent spectrum operations.⁶ The Comptroller is required to submit the report by February 22, 2013.⁷ The Commission should suspend action in the instant proceeding until the Commission and the public have had an opportunity to consider the Comptroller's findings. In addition, the International Bureau's recent proposal to suspend indefinitely LightSquared's authority to deploy its planned terrestrial service⁸ raises further questions as to the objective of this petition.

⁵ See, e.g., *Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz*, Report and Order, 26 FCC Rcd 5710, 5710 ¶ 1 (2011) (taking "steps to make additional spectrum available for new investment in mobile broadband networks").

⁶ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156, § 6408(a) (2012). The law was enacted on February 22, 2012 (H.R. 3630, 112th Cong.).

⁷ *Id.* § 6408(c) (requiring the Comptroller to submit a report on the results of the receiver performance and spectrum efficiency study within one year of enactment).

⁸ FCC Public Notice, *International Bureau Invites Comment on NTIA Letter Regarding LightSquared Conditional Waiver*, IB Docket No. 11-109, DA 12-214, at 4 (rel. Feb. 15, 2012).

In the event the Commission opts to proceed, it should recognize that market forces have, and will continue, to drive improvements in receiver performance without any need for government intervention. In most circumstances, receiver manufacturers for both licensed and unlicensed uses are under incredible market pressure to reduce receiver susceptibility to interference and to use spectrum as efficiently as possible.

In rare instances where market forces may not have produced sufficient improvements, the FCC may want to consider “receiver interference protection limits,” which describe the interference environment in which a receiver is expected to operate.⁹ This approach promotes efficient spectrum use, while still affording manufacturers and service providers the flexibility to innovate. In contrast, “receiver standards,” which dictate receiver design, would stifle innovation.¹⁰

II. THE COMMISSION SHOULD REFRAIN FROM ADDRESSING THIS ISSUE UNTIL THE CONGRESSIONALLY-MANDATED COMPTROLLER GENERAL REPORT IS COMPLETED

The Commission should defer any further action on the issues raised in the Petition until the Commission and the public can fully consider the Comptroller’s study on receiver performance and spectrum efficiency. Just last week, Congress passed, and President Obama

⁹ See Silicon Flatirons Center, *Efficient Interference Management: Regulations, Receivers, and Right Enforcement*, at 5 (Jan. 10, 2012), <http://www.silicon-flatirons.org/documents/Roundtables/2011.10.18-1021/EfficientInterferenceManagement.pdf> (“Silicon Flatirons Efficient Interference Management”); see also Silicon Flatirons Center, *Receiver Standards vs. Protection Limits* (Sept. 2011), <http://www.silicon-flatirons.org/documents/Roundtables/2011.10.18-1021/ReceiverStandardsvsProtectionLimits.pdf>.

¹⁰ See Silicon Flatirons *Efficient Interference Management* at 11; see also *Interference Immunity Performance Specifications for Radio Receivers*, Notice of Inquiry, 18 FCC Rcd 6039, 6049 ¶ 26 (2003) (identifying the “technical standards for radio receivers operating on the interoperability channels in the 700 MHz public safety band” as an example of “receiver standards”).

signed into law the Middle Class Tax Relief and Job Creation Act of 2012.¹¹ Section 6408 of the law requires that the Comptroller “conduct a study to consider efforts to ensure that each transmission system is designed and operated so that reasonable use of adjacent spectrum does not excessively impair the functioning of such system.”¹² This study must be completed by February 22, 2013.¹³

In conducting the study, the Comptroller must consider and address many of the very same issues raised in the Petition. For instance, the Comptroller must consider (i) “the value of . . . improving receiver performance as it relates to increasing spectral efficiency;”¹⁴ (ii) “the role of manufacturers, commercial licensees, and government users with respect to their transmission systems and the use of adjacent spectrum;”¹⁵ (iii) “the feasibility of industry self-compliance with respect to the design and operational requirements of transmission systems and the reasonable use of adjacent spectrum;”¹⁶ and (iv) “the value of action by the Commission and the Assistant Secretary to establish, by rule, technical requirements or standards for non-Federal and Federal use, respectively, with respect to the reasonable use of portions of the radio spectrum that are adjacent to each other.”¹⁷ Each of these considerations relates directly to the Petition’s core issue of whether and how the Commission should address GPS receiver performance as it

¹¹ Pub. L. No. 112-96, 126 Stat. 156, was signed into law on February 22, 2012.

¹² Middle Class Tax Relief and Job Creation Act of 2012 § 6408(a). The term “transmission system” is defined as “any telecommunications, broadcast, satellite, commercial mobile service, or other communications system that employs radio spectrum.” *Id.* § 6408(d).

¹³ *Id.* § 6408(c).

¹⁴ *Id.* § 6408(b)(1)(A).

¹⁵ *Id.* § 6408(b)(2).

¹⁶ *Id.* § 6408(b)(3).

¹⁷ *Id.* § 6408(b)(4).

impacts LightSquared's planned terrestrial operations in the adjacent Mobile Satellite Service ("MSS") band.¹⁸

In light of the substantial overlap of issues, the Commission should await the results of the Comptroller's study before moving ahead with the instant proceeding. The results of the study will enable the Commission to proceed on an informed basis as to the appropriate action, if any, that it should take with respect to the questions surrounding use of adjacent spectrum. Further, if the Commission moves forward in parallel with the Comptroller, then it is possible that the two entities could produce inconsistent recommendations.

III. A SUBSTANTIAL RECORD OF ROBUST AND RESPONSIBLE RECEIVER DESIGN FOR MOBILE DEVICES USING LICENSED AND UNLICENSED SPECTRUM HAS DEVELOPED ABSENT THE IMPOSITION OF GOVERNMENT REGULATION

In the event the Commission opts to proceed to address these issues, it should ensure that its review reflects fully the real world experience across all spectrum bands. Specifically, it should recognize that in many cases market forces drive continual improvement in receiver performance without the need for government regulation. For example, wireless providers require that their mobile receivers meet very stringent design specifications to ensure non-interference and efficient use of spectrum. The receiver technology used by mobile devices is state-of-the-art and extraordinarily robust. Indeed, the interference and operational environment faced by mobile devices requires highly advanced receivers to ensure proper operations. Similarly, manufacturers of devices using unlicensed spectrum must ensure their receivers are not susceptible to interference while still efficiently utilizing the available spectrum because they must operate on a secondary, non-interference basis.

¹⁸ See Petition at 11-22.

Because of the limited amount of suitable spectrum, the high cost of spectrum at auction or in secondary markets, and the dynamic interference environment faced by mobile devices, wireless providers and device manufacturers follow a detailed process to design, develop, and deploy mobile devices that ensures and promotes efficient spectrum use. Mobile devices using licensed spectrum must initially meet applicable industry standards prior to use by wireless providers.¹⁹ Industry has developed receiver specifications to ensure that items such as: (i) reference sensitivity levels, (ii) receiver input levels, (iii) adjacent channel selectivity, and (iv) blocking characteristics are standardized and controlled. Moreover, these requirements are extremely stringent to protect licensed providers from harmful self-interference as well as adjacent band interference from other operations. However, just designing and building equipment to meet internationally recognized industry requirements is not the final step for licensed mobile devices. Next, these devices are evaluated through an industry-driven certification process. Finally, licensed mobile devices are put through rigorous interoperability testing by the individual wireless providers to make certain the device, including the receiver, is operating as intended, in an effective and robust fashion. Any flaw in the design or manufacturing of such a receiver would have an immediate and detrimental effect to the operation of a mobile network, in light of the mobile nature of the devices, the interference environment, and their operation very near the noise floor.²⁰

¹⁹ Examples of wireless standards bodies include 3rd Generation Partnership Project (“3GPP”) and Third Generation Partnership Project 2 (“3GPP2”). *See, e.g.*, 3GPP, About 3GPP, <http://www.3gpp.org/About-3GPP> (last visited Feb. 27, 2012); 3GPP2, About 3GPP2, http://www.3gpp2.org/Public_html/Misc/AboutHome.cfm (last visited Feb. 27, 2012). These industry standards bodies, through a cooperative partnership of equipment manufacturers and wireless providers, develop standards to ensure that all mobile devices interoperate when deployed on mobile networks.

²⁰ *See, e.g.*, Comments of CTIA – The Wireless Association®, *Promoting More Efficient Use of Spectrum Through Dynamic Spectrum Use Technologies*, ET Docket No. 10-237, at 11-12 (filed

Similarly, mobile devices using unlicensed spectrum are often designed and deployed with robust receivers. Unlike licensed radio services, unlicensed mobile devices are only permitted to operate on a secondary, non-interference basis to other radio services. This means that not only must they not cause interference to other primary services, but they also must accept interference to their operations. For an unlicensed device to work properly, its receiver must generally be able to withstand interference from primary radio services as well as interference from other unlicensed devices operating in the same spectrum bands.²¹

Many consumer-based unlicensed devices also follow a certification process that is similar to licensed devices. For example, to carry a “Wi-Fi Certified” label, the Wi-Fi Alliance must certify the device.²² This certification process ensures that devices are interoperable and comply with the relevant Institute of Electrical and Electronics Engineers (“IEEE”) radio standards.²³

The record of stringent receiver design for mobile devices using licensed and unlicensed spectrum has developed absent the imposition of government mandates. Equipment

Feb. 28, 2011) (“Advanced power control . . . allows providers to transmit signals at lower and lower power levels, which has several important consequences. The noise floor decreases over time. As nearby systems use lower signal levels, potentially interfering signals are more attenuated, allowing the use of even more sensitive receivers and lower power levels, which in turn enables greater reuse of spectrum and increased spectrum efficiency. However, use of weaker power signals makes these signals increasingly subject to interference as mobile devices come close to each other, making interference protection even more important.”).

²¹ See, e.g., *Modification of Parts 2 and 15 of the Commission’s Rules for Unlicensed Devices and Equipment Approval*, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd 11383, 11390 ¶ 19 (2007) (recognizing that “there is the potential under [the FCC’s] rules for some unlicensed devices to preclude the operation of other unlicensed devices”).

²² See Wi-Fi Alliance, Programs, <http://www.wi-fi.org/certification/programs> (last visited Feb. 27, 2012) (“Since 2000, the Wi-Fi Alliance has worked with [its] members to complete more than 11,000 product certifications.”).

²³ See *id.* (including IEEE 802.11a, 802.11b, 802.11g, and 802.11n).

manufacturers and wireless providers have a strong self-interest to develop and deploy devices that are as immune to interference as possible and create as little interference as possible.

IV. RECEIVER INTERFERENCE PROTECTION LIMITS MAY HELP PROMOTE EFFICIENT SPECTRUM USE AND INNOVATION IN CERTAIN CASES

As an initial matter, the Commission lacks clear legal authority to broadly regulate receiver performance.²⁴ However, should the FCC seek to look beyond market forces to promote receiver performance in some limited situations, it may wish to explore the potential effectiveness of implementing “receiver interference protection limits.”²⁵ In comparison to “receiver standards,”²⁶ receiver interference protection limits more accurately describe the relationship between receivers and their operational impact on adjacent spectrum, and provide manufacturers and service providers with the flexibility to continue to innovate while still facilitating efficient use of adjacent spectrum. Receiver interference protection limits would be an input to the design process, while leaving the specific technical solution to the party who understands all the other tradeoffs including accuracy, cost, power consumption, and responsiveness. In contrast, approaches such as “receiver standards” inappropriately put the

²⁴ See, e.g., *Development of Operational, Technical and Spectrum Requirements For Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010*, Second Notice of Proposed Rulemaking, 12 FCC Rcd 17706, 17739 ¶ 71(1997) (observing that “the Commission’s authority to regulate receiver performance may be limited”); see also Comments of CEA, ET Docket No. 03-65, MM Docket No. 00-39, at 11-13 (filed July 21, 2003) (discussing the Commission’s lack of authority to adopt receiver standards).

²⁵ “Receiver Interference protection limits” would specify the in- and out-of-band interference environment that the receiver is expected to operate in so that the characteristics of the receiver are developed to ensure the successful operation in that environment.

²⁶ “Receiver standards” would specify specific minimum technical performance requirements for receivers, including sensitivity and front-end performance.

government in the role of receiver designer, imposing specific technical solutions that would undoubtedly chill innovation.²⁷

CEA is not alone in favoring the use of receiver interference protection limits in those instances where market forces alone may not suffice. In a report recently released by the Silicon Flatirons Center, a diverse and widely-respected group of experts from government, industry, and academia agreed that, on balance, receiver interference protection limits are preferable to receiver standards.²⁸ The report concluded that, while receiver protection limits are new and compliance may be more difficult to assess, appropriately tailored protection limits are preferable to receiver standards which are “prescriptive, detailed, and may stifle innovation in business models and engineering.”²⁹

²⁷ For example, if the government had mandated a particular receiver design for all commercial GPS devices, that mandated design would likely have failed to anticipate or meet the competing demands of high accuracy products, aviation safety products, and affordable consumer navigation devices, and thus, would have potentially prevented the development and introduction of these diverse and valuable products.

²⁸ See Silicon Flatirons Efficient Interference Management at 11.

²⁹ *Id.*

