

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of	)	
	)	
Federal Communications Commission Invites Comment on LightSquared Request to Modify its ATC Authorization	)	IB Docket No. 12-340
	)	
	)	
International Bureau Invites Comment on NTIA Letter Regarding LightSquared Conditional Waiver	)	IB Docket No. 11-109
	)	
	)	
LightSquared Subsidiary LLC Request for Modification of its Ancillary Terrestrial Component Authority	)	File No. SAT-MOD-20120928-00160
	)	File No. SAT-MOD-20120928-00161
	)	File No. SAT-MOD-20101118-00239
	)	File No. SES-MOD-20121001-00872
	)	
LightSquared Subsidiary LLC Petition for Rulemaking to Allocate the 1675-1680 MHz Band for Terrestrial Mobile Use	)	RM-11681
	)	
	)	
Comments Sought on LightSquared Subsidiary LLC <i>Ex</i> <i>Parte</i> Filing	)	WT Docket No. 12-327
	)	

**COMMENTS OF THE  
GENERAL AVIATION MANUFACTURERS ASSOCIATION**

The General Aviation Manufacturers Association (“GAMA”) hereby submits these comments in response to the August 7, 2013, *Public Notice* seeking comment on LightSquared Subsidiary LLC’s *ex parte* filing of July 15, 2013 (the “*Ex Parte*”) in the above-referenced proceedings.<sup>1</sup> The *Ex Parte* presents technical analyses of the potential effect of LightSquared terrestrial uplink devices utilizing channels in the 1626.5-1660.5 band on Global Positioning System (“GPS”) devices used for various purposes, including aviation. Prior to allowing use of such handsets, the Commission and NTIA must coordinate with other federal agencies, such as

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<sup>1</sup> See *Comments Sought on LightSquared Subsidiary LLC Ex Parte Filing*, Public Notice, DA 13-1717 (rel. Aug. 7, 2013) (“*Public Notice*”).

the Federal Aviation Administration (“FAA”), to ensure that LightSquared’s proposed handsets do not have a negative impact on aviation GPS. Coordination with other agencies is particularly essential because many of the technical claims that LightSquared makes in the *Ex Parte* raise questions and concerns, and they need to be resolved by aviation regulators and aviation interests.

The general aviation industry includes the production, maintenance, and operation of FAA-certified aircraft other than military aircraft and aircraft used for scheduled commercial passenger air and transport services. GAMA’s 84 member companies build nearly all of the general aviation aircraft flying worldwide today, and they also operate fleets of aircraft, pilot/technician training centers, and maintenance facilities worldwide.<sup>2</sup> GAMA represents its member airplane, helicopter, and aircraft component manufacturers before government agencies around the world. GAMA’s aim is to advance the general welfare, safety, interests, and activities of the general aviation industry.

General aviation is an essential part of the national transportation system in the United States and in many countries around the world. It is especially critical for individuals and businesses that need to travel and move goods quickly and efficiently in today's just-in-time market. It is also a necessity for rural communities that lack commercial air service. Equally important, general aviation is a significant contributor to economies around the world. In the United States alone, general aviation supports over 1.2 million jobs, provides \$150 billion in economic activity, and, in 2012, generated \$4.8 billion in exports of domestically manufactured

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<sup>2</sup> For additional information about GAMA, see <http://www.GAMA.aero/> (last visited Sep. 6, 2013).

airplanes.<sup>3</sup> General aviation is also one of the few manufacturing industries that provides a positive balance of trade for the United States.

The *Ex Parte* addresses several types of GPS devices and associated use cases. With respect to GPS used in aviation, it introduces analyses for several new use cases that were not considered in prior studies: (i) passengers using LightSquared handsets on an aircraft; (ii) a number of passengers with LightSquared handsets operating near an aircraft situated at a gate; and (iii) a single user at the top of stairs for entering an aircraft from the runway.<sup>4</sup> A close examination of each of the three cases shows, however, that LightSquared has made assumptions that have not been reviewed by the aviation community, including regulators, and its analysis, in many instances, is not appropriate for operations raising safety of life concerns.

LightSquared's examination of passengers using handsets inside an aircraft raises a number of concerns. Its analysis concludes that "the emissions received [from LightSquared handsets] by the GPS antenna would not exceed the limits established in existing FAA/RTCA/ICAO standards."<sup>5</sup> But, in deriving this conclusion, LightSquared's methodology leaves much to be desired. LightSquared's analysis relies on path loss measurements from a Boeing 737-200 aircraft documented in a National Aeronautics and Space Administration ("NASA") study.<sup>6</sup> The Boeing 737-200 is a large air transport aircraft, and such measurements are not applicable to the much smaller aircraft employed in general aviation. The *Ex Parte* explains that, in addition to using path loss values from NASA, LightSquared utilized "a fixed

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<sup>3</sup> MERGE GLOBAL, GENERAL AVIATION'S CONTRIBUTION TO THE U.S. ECONOMY 2 (2006) *available at* [http://www.ok.gov/OAC/documents/General%20Aviation%20Contribution%20to%20the%20US%20Economy%20\(GAMA\).pdf](http://www.ok.gov/OAC/documents/General%20Aviation%20Contribution%20to%20the%20US%20Economy%20(GAMA).pdf); GENERAL AVIATION MANUFACTURERS ASSOCIATION, 2012 GENERAL AVIATION STATISTICAL DATABOOK AND INDUSTRY OUTLOOK 7 (2013) *available at* [http://www.gama.aero/files/GAMA7233\\_AR\\_FINAL\\_LOWRES.pdf](http://www.gama.aero/files/GAMA7233_AR_FINAL_LOWRES.pdf).

<sup>4</sup> *See Ex Parte* at 13-19.

<sup>5</sup> *Id.* at 15.

<sup>6</sup> *Id.* at 14-15, Appendix 3.

Tx/Rx antenna coupling loss of 3 dB.”<sup>7</sup> Such an approach, however, improperly minimizes the potential effects of its handsets. LightSquared actually “double counted” the antenna effects because it took a 3 dB credit for the coupling loss between the receive and transmit antennas that had already been included in the NASA path loss measurements.<sup>8</sup>

LightSquared also presents an alternate scenario that supposedly shows seven users dispersed throughout an aircraft cabin and uses an “average path loss” figure of 74.0 dB.<sup>9</sup> According to LightSquared’s analysis, aggregating seven users with this power level results in a lower total interference power than might be expected from a single user operating in a window seat in the very front of an aircraft, probably because users in the first few rows may be closer to an aircraft’s GPS antenna.<sup>10</sup> Reliance on this random analysis, which very likely understates the interference potential from handsets actually used near GPS devices, is not suitable when safety-of-life is at stake.

LightSquared’s analysis of a single user on the stairs of a regional jet employs questionable methodology and relies on unreasonable assumptions. Specifically, LightSquared assumes a +20 dBm maximum transmit power rather than +23 dBm for a single user.<sup>11</sup> In Table 6, it notes that this -3 dB adjustment is made to account for -3 dBi average user equipment antenna gain.<sup>12</sup> By contrast, LightSquared addresses this problem in its general location/navigation GPS device analysis and adds 3 dB to account for user equipment antenna

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<sup>7</sup> *Ex Parte* at 14.

<sup>8</sup> *See NASA, Portable Wireless LAN Device and Two-Way Radio Threat Assessment for Aircraft Navigation Radios*, NASA/TP-2003-212438, 77 (2003) available at [http://ia700606.us.archive.org/5/items/nasa\\_techdoc\\_20030067884/20030067884.pdf](http://ia700606.us.archive.org/5/items/nasa_techdoc_20030067884/20030067884.pdf).

<sup>9</sup> *See Ex Parte*, Appendix 3 at 1-3.

<sup>10</sup> *Compare Ex Parte*, Appendix 3 at 3 with *id.* at 4-5.

<sup>11</sup> *See Ex Parte*, Appendix 5 at 2.

<sup>12</sup> *Ex Parte* at 17.

gain, demonstrating a willingness to selectively apply corrections to present data in the best possible light.<sup>13</sup> LightSquared also assumes a 10 dB coupling loss for the GPS receive antenna on the basis that the user is more than 30 degrees below the receive antenna horizon and assumes a three-meter separation between the handset and GPS receive antenna. These are not reasonable assumptions for all aircraft types.

In its analysis of 25 users with handsets emitting a signal in a terminal near an aircraft's gate, LightSquared books 3 dB of loss for the GPS receive antenna, claiming that the GPS receive antenna has -3 dBi of gain for signals below 45 degrees elevation relative to the horizon.<sup>14</sup> LightSquared bases this assumption on antenna gain pattern measurements reported in RTCA/DO-253B (Appendix G, Figure G-13, p. G12); these antenna measurements are used by RTCA to validate a model of GPS antenna gain for signals below the horizon and are not intended to be representative of maximum antenna gain above the horizon.<sup>15</sup> LightSquared's estimates are more favorable to it than the model actually employed in the RTCA, Inc. analysis, which is based on published performance standards for GPS receive antennas.

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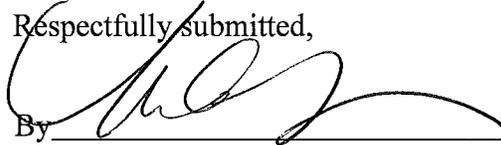
<sup>13</sup> *Id.* at 6-9.

<sup>14</sup> *Id.* at Appendix 5 at 5.

<sup>15</sup> See RTCA, Inc., *Assessment of Radio Frequency Interference Relevant to the GNSS L1 Frequency Band*, Document No. DO-235B, at Appendix G at G-12 (March 13, 2008); *id.* at 17-18; RTCA, Inc., *Aeronautical Spectrum Planning for 1997 - 2010*, Document No. DO-237, at 6-7 (Jan. 27, 1997).

The examples above from the *Ex Parte* raise serious questions. Overall, LightSquared's analysis is unsound and does not provide a basis for Commission action. Prior to taking any action on LightSquared's proposal, it is imperative that the Commission seek input from other federal agencies, including those with expertise in aviation matters.

Respectfully submitted,

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