

Coalition to Save Our GPS

Uniting to Protect GPS – A National Utility for More than 30 Years

Members Update

July 26, 2011

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Trimble

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National Association of Manufacturers

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VP of Global Public Policy
Association of Equipment Manufacturers

Agenda

A satellite with a gold-colored body and solar panels is shown in orbit above Earth. The Earth's surface is visible, featuring a large, swirling hurricane. The sun is visible on the horizon, creating a bright glow and illuminating the satellite and the planet's atmosphere.

- I. Welcome and Introductions
- II. Issue Update
- III. Actions to Take
- IV. Q&A

Coalition to Save Our GPS



Uniting to Protect GPS – A National Utility for More than 30 Years

Goal: Protect GPS from LightSquared's interference.

Be vocal and visible before Congress, Administration and FCC by leveraging the resources of coalition members to educate and inform decision makers.

Promote awareness of issue among users of GPS and in the news media.

The LightSquared system must not be deployed unless it can be conclusively guaranteed that GPS systems used across many critical sectors are fully protected from interference.

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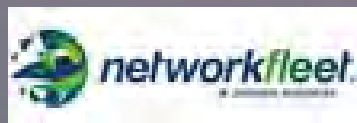
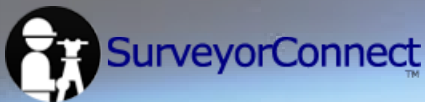
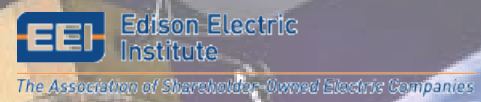
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A satellite with a gold-colored body and solar panels is shown in space, orbiting Earth. The Earth's blue and white clouds are visible in the background, along with the blackness of space and distant stars.

Update: July 2011

LightSquared at the FCC

The January 2011 conditional waiver by the FCC's International Bureau (FCCIB) waived its rules to allow new and previously unauthorized terrestrial use of the mobile satellite spectrum (MSS) immediately adjacent to the frequency band used by GPS receivers – utilizing extremely high-powered ground-based transmissions that subsequent tests have conclusively proven cause severe interference to hundreds of millions of GPS receivers.

This action by the FCC set in motion a series of events and developments...

Update: July 2011

LightSquared at the FCC (Cont.)

- There has been growing, widespread and outspoken opposition to the plans of LightSquared to deploy 40,000 ground stations in the spectrum adjacent to GPS signals in satellite frequency bands reserved for decades for use by GPS, a valued national utility.
- Serious concerns about the disastrous effects LightSquared's plans could have on GPS have been continually raised by key U.S. government officials, along with members of the GPS user and manufacturer community. Under the umbrella of the Coalition to Save Our GPS, more than 100,000 companies and millions of individuals are represented either independently or through trade associations.
- A five month technical study found conclusively that LightSquared's plans would cause widespread harmful interference to hundreds of millions of GPS receivers.
- A vitally important public comment period is now underway to provide the public with the opportunity to weigh in on the value of GPS in their everyday lives and the harm that LightSquared's plans would cause to their use of GPS.

Update: July 2011

LightSquared's "Hail Mary" Move

- **June 15:** LightSquared requests and is granted a two-week extension.
- **June 20:** LightSquared abruptly issues a two-page news release announcing its "solution" to the problem.
- **June 30:** 975-page TWG report filed. LightSquared simultaneously submits its own "Recommendation" document that calls for use of the lower band, but cites absolutely no data to prove it will eliminate GPS interference.

Just as LightSquared was wrong in 2010 and the first six months of 2011, it is wrong now.

The utter failure of LightSquared's initial deployment plans to pass interference tests raises fundamental questions about the representations LightSquared made to the FCC prior to its January 2011 decision, and raises significant questions about the credibility of LightSquared's various claims.

Update: July 2011

LightSquared at the FCC: Where we are now

- FCC announced a 30-day comment period, followed by a 15-day response period, which is currently ongoing and will go through August 15.
- We anticipate that NTIA will consult with the FCC on concerns of federal GPS users.
- FCC has made no public comments on how they will proceed after comment period has ended.
- The National Executive Committee for Space-Based Positioning, Navigation, and Timing (PNT) recommends further studies before FCC authorizes LightSquared to proceed.
- Congress will be watching FCC actions closely.



Update: July 2011

The Technical Working Group (TWG)

Technical Working Group consisting of LightSquared and representatives from the GPS user and manufacturer communities tested more than 100 different GPS devices.

The tests were conducted in laboratory, anechoic chamber and “live sky” test environments, with more than 100 engineers, technical experts and advisors participating in the study and preparation of the final report.



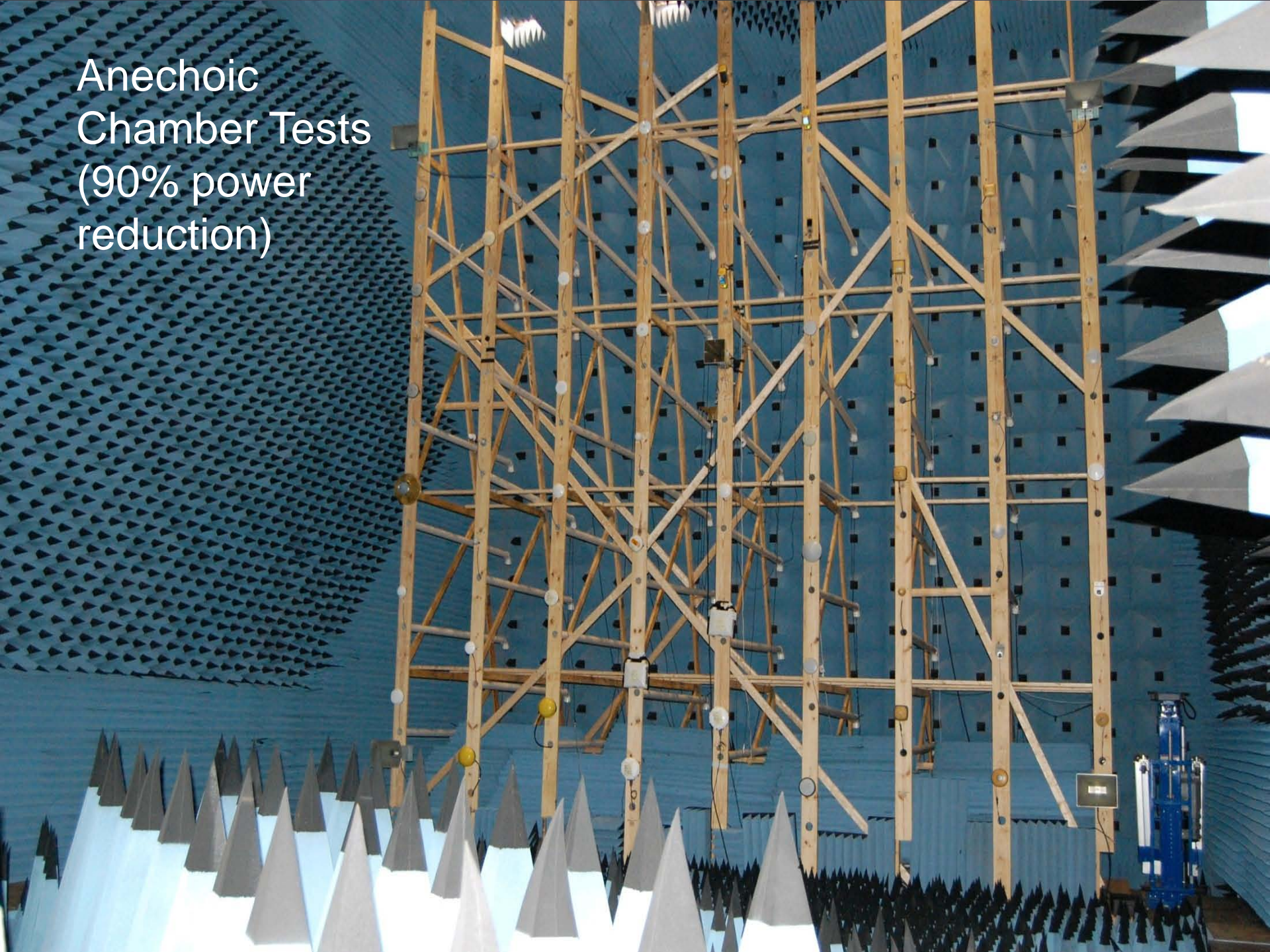
Update: July 2011

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Anechoic Chamber Tests
(90% power reduction)



Update: July 2011

The Technical Working Group (TWG)

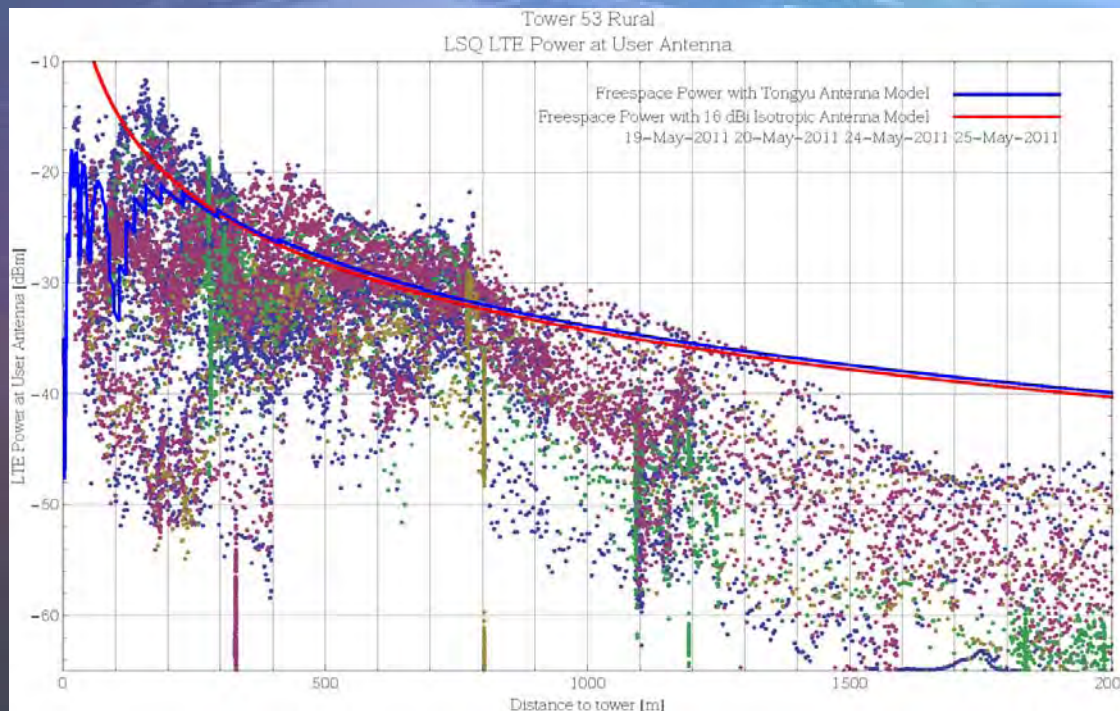


Live Sky Tests, Las Vegas (90% power reduction)



Update: July 2011

The Technical Working Group (TWG)



- Peak power level recorded on the ground in Las Vegas 794,000,000,000 times more powerful than distant GPS signals.
- 1,000,000,000 times the power of the GPS signal seen almost a mile from the tower.

Update: July 2011

The Technical Working Group (TWG)

Sub-Group	Deployment Plan	Lower 10MHz Initial Step
Aviation	“GPS-based operations are expected to be unavailable over entire regions of the country at any normal operational aircraft altitude.”	“Compatibility of aviation GPS operations with a single lower 10 MHz channel could not be determined definitively without additional study”
Cellular	Found “..harmful interference for devices while receiving GPS at significant distances [hundreds of meters to several kilometers] from LightSquared base stations and thus impact E911 or LBS location fixes that are either delayed or inaccurate.”	“[O]perations in the lower bands (1526 to 1536 MHz) may be possible”, “ within grasp ”, “..testing in the lower bands (1526-1536 MHz) fewer devices had a level of susceptibility.” Test data in the report shows interference in the lower 10MHz channel to cell phones.
General Location & Navigation	“The General Location/Navigation sub-team has concluded that all phases of the LightSquared deployment plan will result in widespread harmful interference to GPS signals and service and that mitigation is not possible.”	“Lab testing revealed that many devices suffered from harmful interference from the lower 10 MHz channel ; specifically, 20 out of 29 devices experienced harmful interference.” https://www.saveourgps.org

Update: July 2011


The Technical Working Group (TWG)

Sub-Group	Deployment Plan	Lower 10MHz Initial Step
<p>High Precision, Networks & GPS Timing</p>	<p>The LightSquared Base Station 4G LTE signals harmfully interfere with High Precision, Timing, and Network GPS receivers over long ranges....</p> <p>“The LightSquared Base Station signals cause harmful co-channel interference with the FCC licensed StarFire and OmniSTAR augmentation systems.</p>	<p>“In the lower 10 MHz channel configuration, 31 of 33 High Precision and Network GPS receivers tested experienced harmful interference within the range of power levels that would be seen inside the network”</p> <p>Mitigation may be possible for some narrowband Timing receivers. (with unplanned replacement)</p>
<p>Space (GPS receivers used on satellites in earth orbit)</p>	<p>“In NASA’s view, the interference to space-based GPS receiverswould be severely disruptive to NASA’s science missions based on the test and analysis conducted in the TWG”.</p>	<p>“...if the LightSquared signal is limited to just the lower portion of the MSS allocated band at 1525-1559 MHz...by NASA for space science are affected to a significant extent by these signals”...</p>

LightSquared's "new" plans do not solve the problem

- LightSquared belatedly realized the potential for massive interference and requested study of an alternate deployment scenario late in the FCC process.
- LightSquared's new proposal would limit operations to the lower portion of MSS band, at least initially.
- This new proposal still only separates high powered operations from GPS by a total of 25 MHz, versus minimum of ~100 MHz for other high powered mobile services.
- Limited test results still show substantial interference to all categories of GPS devices tested.
- LightSquared has not substantiated claims of elimination of interference to "99.5% of GPS receivers" - Working group results show more than half of receivers tested suffered interference from lower band only.

This is not a problem with GPS receivers

A GPS satellite is shown in orbit above the Earth. The satellite has a gold-colored body and two large solar panel wings. A large satellite dish antenna is visible on the satellite. The Earth's surface is visible below, showing a large circular feature, possibly a storm or a large body of water. The sky is dark with some stars visible.

- In the tests, GPS receivers tested proved able to resist signals thousands or even millions of times more powerful than GPS in the adjacent band.
- Hundreds of billions of times is not reasonable.
- This is not a GPS receiver, filter or design problem. It is a problem of incompatibility.
- Filters that can block signals billions of times stronger in adjacent spectrum do not exist. Nor did they 8-10 years ago.

The Way Forward

A satellite with a gold-colored body and solar panels is shown in orbit against the backdrop of Earth. The Earth's surface is visible with blue oceans and white clouds, and the horizon is lit by a bright light source, likely the sun, creating a lens flare effect.

The GPS industry has worked in a committed fashion with LightSquared, FCC, NTIA, and other interested parties in the FCC's TWG process, culminating in the June 30, 2011 release of the TWG final report.

The LightSquared system must not be deployed unless it can be conclusively guaranteed that GPS systems used by millions of Americans in critical sectors are fully protected from interference.


LightSquared has said it has other spectrum and it should use it.

What the Coalition Recommends Based on the FCC Study Results

A satellite with a gold-colored body and solar panels is shown in space, orbiting Earth. The Earth's blue and white clouds are visible in the background, along with the blackness of space and distant stars.

1. The FCC should stop wasting time and effort attempting to allow incompatible use of the MSS band L-Band.
2. The tests have shown conclusively that LightSquared's planned deployment is totally incompatible with GPS. This is not a problem the GPS industry can or should be required to solve – LightSquared must use or find spectrum that does not create GPS interference issues.
3. If LightSquared wishes to pursue other plans that were not fully tested as part of the TWG process, testing should be conducted by neutral, third parties with full industry participation at LightSquared's expense using the parameters at which LightSquared will actually operate. However, only if *those* tests conclusively demonstrate that there is no interference to GPS reception can LightSquared be permitted to proceed.
4. Given the critical nature of GPS interference, this matter should be dealt with at the commissioner level and not at the staff level as before.

What You Can Do



- **Submit Comments to the FCC between now and August 15, 2011.**
Detailed information on how to contact the FCC and what to include in correspondences is available on the coalition's website.
- **Stay in contact with your Representatives in the U.S. House and Senate.**
- **Make your views known.**
 - Include information in your e-newsletters and other materials.
 - Contact the Media.
 - Submit letters to the editor in mainstream publications.
 - Contact trade publications with industry standpoints.

How to Get Involved



To contact your Representatives in the U.S. House and Senate, visit www.house.gov or www.senate.gov to search by state or zip code.

For more detailed information, including the proposed remedies the Coalition seeks from the FCC, click the “voice your concerns” tab on the Coalition’s homepage at www.saveourgps.org.

Coalition to Save Our GPS

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