QUALCOMM Incorporated

1730 Pennsylvania Ave., NW ■ Suite 850 ■ Washington, DC 20006 ■ Tel: 202.263.0022 www.qualcomm.com

July 11, 2014

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

**Re: Expanding Access to Broadband and Encouraging Innovation by Establishment of an Air-Ground Mobile Broadband Secondary Service for Passengers Aboard Aircraft in the 14.0-14.5 GHz Band; GN Docket No. 13-114, RM-11640**

Dear Ms. Dortch:

QUALCOMM Incorporated ("Qualcomm") hereby responds to certain issues raised in Gogo Inc.'s July 1, 2014 letter in this proceeding.

***License Size***. Gogo wants the Commission to divide the 14.0 - 14.5 GHz band into four 125 MHz-wide spectrum licenses. Gogo asserts that a system designed to operate in a 125 MHz-wide spectrum block would provide a robust service with substantially greater capacity than Gogo's own existing Air-to-Ground network.[1]

However, Qualcomm has explained that the upper and lower portions of the band, require coordination with and protection of radio astronomy and TDRSS, respectively, and in certain areas of the Continental U.S. ("CONUS") would impact the upper most and lower most 125 MHz spectrum blocks. Rather than create four 125 MHz blocks, two of which would suffer from impairments and face a bandwidth limitation and two of which would have no impairment at all, it is far more equitable and efficient to create two 250 MHz blocks so that in the impacted areas, each licensee has sufficient bandwidth despite the impairments.

Qualcomm also explained that to support bandwidth-intensive applications to all aircraft passengers flying above CONUS, such as full motion video, a 250 MHz-wide spectrum block is needed.[2] A single 125 MHz-wide license would not be able to provide full broadband connectivity to each passenger, and thus offer the kind of user experience that we're all used to having on the ground. That is the Commission's goal in this proceeding. In fact, a recent survey published by Honeywell explains that 86% of U.S. air travelers would give up an in-flight amenity (such as more legroom, food and beverage service, or even restroom access) to have a faster and more consistent in-flight wireless connection.[3] For these reasons, Qualcomm again urges the Commission to create two 250 MHz spectrum blocks.

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1 *See* Gogo July 1, 2014 Letter at 2.

2 *See* Qualcomm Reply Comments (Sept. 23, 2013) at 9-11; *and see* Qualcomm Comments (Aug. 26. 2013) at 11-12, 15-16.

3 *See* Honeywell Connectivity Graphic Infographic *accessible at* http://aerospace.honeywell.com/priorities/connectivity (noting also that nearly half of these travelers are frustrated by their slow and inconsistent on-board Wi-Fi service).

***Maximum Average G/T.*** With no supporting analysis, Gogo asks the FCC to use a G/T level of 6 dB/K for determining the maximum interference level into the GSO arc. At the same time, Gogo asks the FCC to eliminate critically important rule sub-sections 22.1120(a), (b) & (c) that set out conditions to guarantee that the ΔT/T into the GSO arc remains well below one percent. The FCC should not adopt either of Gogo's proposals.

Qualcomm has shown that an average G/T greater than 4 dB for the emissions limits for CONUS beams into the GSO arc would not be appropriate and would unduly impact the proposed new service.[4] Using very conservative assumptions, Qualcomm showed that the limit for the average G/T over the CONUS is under 4.5 dB even with a high performing antenna and low-noise amplifiers. Qualcomm explained that where G/T exceeds 4 dB/K, the satellite beam is very likely a regional beam that does not evenly cover all of CONUS and does not see all the Air-Ground Mobile Broadband Service base stations or airplanes at that same G/T.[5]

Adopting Gogo's proposal for a G/T level of 6 dB/K will unduly impair the air-ground service. There also is no reason for the Commission to adopt Gogo's proposal to eliminate the rule subsections that guarantee that the ΔT/T into the GSO arc remains below one percent.

***Characterization of Antenna Performance***. Gogo also takes issue with the proposed rule to ensure that the Air-Ground Mobile Broadband ground station and aircraft antennas perform in accordance with the FCC's rules,[6] claiming that the proposed regulations reflect the design approach outlined by Qualcomm and thus are not technology neutral.[7] Qualcomm disagrees. Qualcomm has maintained throughout this proceeding that the detailed technical analyses it has provided reflect one example of how an air-ground mobile broadband system could be deployed in this band, and we have always urged the FCC to adopt technology neutral rules. Qualcomm believes the FCC has gone to great lengths to propose regulations that do not mandate the use of any particular technology while ensuring that whatever technology or technologies are deployed protect incumbent primary users from harmful interference.

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Qualcomm appreciates the Commission's thorough work in this proceeding and encourages the FCC to adopt rules authorizing the Air-Ground Mobile Broadband Service on a secondary licensed basis in the 14.0-14.5 GHz band in accordance with the proposed regulations in the Commission's NPRM, as amended by Qualcomm, as soon as possible.

Respectfully submitted,

*John W. Kuzin*

John W. Kuzin
Senior Director, Government Affairs – Regulatory

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4 *See* Qualcomm Reply Comments at 13-14, 19, 24 & 28-29. Qualcomm also asked the satellite industry to provide a G/T map of high performing satellites so that it could determine an appropriate value by averaging the G/T map, but no such map has been provided.

5 *See id*. at 13; Qualcomm Comments at 24-26.

6 *See* Qualcomm (Dec. 11, 2013) Letter Filing, Proposed Rule Section 22.1124 Air-Ground Mobile Broadband System Antenna Performance

7 *See* Gogo Letter at 7-8.

cc (via email):

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|---|---|
| James Ball | Brian Regan |
| Kathleen Collins | Ronald Repasi |
| Mindel De La Torre | Bruce Romano |
| Howard Griboff | Roger Sherman |
| Julius Knapp | Troy Tanner |
| Sean O'More | Byung Yi |