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May 27, 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 through 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 the Satellite Industry Association's ("SIA's") May 21, 2014, letter in the above-referenced dockets. Despite taking more than five months to respond to Qualcomm's suggested revisions to the FCC's proposed rules, SIA simply repeats arguments that Qualcomm has fully and repeatedly responded to as explained below.

SIA repeats its refrain that there is no need for the new service and that consumer demand can be met with existing spectrum allocations, citing an AT&T press release announcing the company's plans to provide in-flight Internet access. *See* SIA Letter at 2. As SIA's member companies know well, particularly those who are working to enhance their own satellite-based in-flight communications offerings,[1] the demand for broadband connectivity to airplanes is skyrocketing. Indeed, as AT&T's Chief Strategy Officer, John Stankey, explains in the press release cited by SIA as to why AT&T is getting into the market: "Everyone wants access to high-speed, reliable mobile Internet wherever they are, including at 35,000 feet."[2]

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[1] *See, e.g.*, Revisions of Parts 2 and 25 of the Commission's Rules to Govern the Use of Earth Stations Aboard Aircraft Communicating with Fixed-Satellite Service Geostationary-Orbit Space Stations Operating in the 10.95-11.2 GHz, 11.45-11.7 GHz, 11.7-12.2 GHz and 14.0-14.5 GHz Frequency Bands, *Second Report And Order And Order On Reconsideration*, FCC 14-45, IB Docket No. 12-376 (Apr. 18, 2014) (elevating ESAA service to primary status based upon support from Boeing Co., Panasonic Avionics Corp., Row 44, Inc., the Satellite Industry Association, and ViaSat, Inc., each aiming to serve the in-flight broadband market).

[2] *See* AT&T Press Release, Mobilizing the Sky: AT&T Building 4G LTE In-Flight Connectivity Service (Apr. 28, 2014) *available at* http://about.att.com/story/mobilizing_the_sky_att_building_4g_lte_in_flight_connectivity_service.html

The FCC's proposed Air-Ground Mobile Broadband Service in the 14 GHz band will provide in-flight airline passengers with the same level of broadband connectivity that they enjoy on the ground, which is exactly what they want. SIA presents nothing to the contrary.

SIA next takes issue with several of Qualcomm's suggested revisions to the rules proposed in the NPRM — revisions contained in Qualcomm's December 11, 2013 letter. SIA wrongly claims that the entire 1% ΔT/T will be allocated to the Air-Ground Mobile Broadband Service. As Qualcomm has shown, the power limits it is proposing will ensure that the ΔT/T for the new secondary service will remain well under 0.5%. Specifically, Qualcomm's March 28, 2012 filing in RM-11640 showed that the assumptions and methodology used to determine the ΔT/T of 0.5% from all base station and aircraft transmitters were conservative by at least 10 dB.[3] Thus, there is more than adequate margin already in the ΔT/T level for the baseline emission limit of -76.5 dBW/Hz for each base station beam and aircraft into the geo-arc, which assumes an average satellite G/T of 4 dB. Moreover, SIA member company Echostar agrees with Qualcomm and the FCC that the approach set out in the proposed rules is a feasible means of protecting FSS operations. *See* Echostar Comments at 8.

Qualcomm also previously explained that allowing some base stations to operate with 6 dB more power to compensate for adverse atmospheric conditions will not cause interference to FSS operations because the aggregate interference will at no time exceed the maximum allowable level of -48.7 dBW/Hz. *See* Qualcomm Dec. 11, 2013 letter filing at 8 (proposing revision to Rule Section 22.1120(c)). This also applies for the transmit power level from each aircraft; there is a limit on the per-plane emissions level and the aggregate EIRP from all air-ground mobile broadband aircraft stations over CONUS towards any point in the GSO arc. *See id*. (proposing revision to Rule Section 22.1120(b)). The proposed rules will adequately protect GSO satellite systems as the FCC has found.

SIA also misreads the proposed rules — the proposed rules do not contemplate having multiple licenses operate on the same swath of spectrum. *See* SIA Letter at 4. SIA's concerns with such an operational scenario will not be present because there will only be a single secondary Air-Ground Mobile Broadband licensee operating in a given swath of spectrum. Thus, should harmful interference to GSO FSS operations occur — which in Qualcomm's view is virtually impossible given the detailed interference assessment and testing that it has performed and provided to the Commission — there will be a single secondary licensee for the primary satellite operator to contact for remediation purposes. Thus, SIA's proposed "real-time" recordkeeping requirement is unnecessary. *See* SIA Letter at 6.

Qualcomm's February 7, 2014 letter filing provided a detailed explanation and sound proposal for protecting NGSO operations. SIA, in its May 21, 2014 letter, agrees with Qualcomm that the lowest elevation angles that NGSO systems currently operate at is eight degrees, but SIA still objects to an FCC requirement that a future NGSO licensee merely provide notice to an Air-Ground Mobile Broadband licensee if the NGSO operator plans to provide service at elevation angles below eight degrees as Qualcomm has proposed. The purpose of the notice requirement is to allow the secondary Air-Ground Mobile Broadband licensee to work with the primary NGSO licensee and ensure that the primary service is protected from interference. As Qualcomm has explained, it is unfair to require the Air-Ground Mobile Broadband Service licensee to protect an NGSO system that does not yet exist (and may not ever

[3] *See also* Qualcomm Reply Comments in GN Docket No. 13-114 at 28.

exist), particularly one that operates at elevation angles that are not used in any spectrum band, let alone the 14.0 to 14.5 GHz band. The proposed means of protecting future NGSO systems in Qualcomm's February 7 letter is entirely reasonable, particularly when Qualcomm has shown that a 1% ΔT/T limit to one or more NGSO systems would impose severe constraints on the Air-Ground Mobile Broadband system with no real corresponding benefit to any future NGSO system. *See* Qualcomm Reply Comments at 31-37 (showing that the difference between handling a 1% versus a 6% ΔT/T to an NGSO satellite is ~0.2 dB and may be addressed by allowing the NGSO earth stations to use 0.2 dB greater EIRP, which is a negligible additional cost for the small percentage of time that the condition exists).[4]

To reiterate, and in conclusion, Qualcomm has explained that the regulatory parameters proposed in its December 11, 2013 and February 7, 2014 letter filings would provide more than adequate protection for primary users of the spectrum (*i.e.*, GSO and future NGSO satellite licensees) and enable a viable Air-Ground Mobile Broadband Service to be successfully deployed on a secondary basis in the band. Accordingly, Qualcomm encourages the FCC to issue a Report and Order authorizing the Air-Ground Mobile Broadband Service on a secondary licensed basis in the 14.0-14.5 GHz band in accordance with those parameters as soon as possible.

Respectfully submitted,

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cc (via email):

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[4] Qualcomm also previously addressed in its reply comments (at 39-41) the protection of irregular FSS operations, such as launch and early orbit phases and satellite transfer orbits, which SIA raises once again, *see* SIA Letter at 6-7. Qualcomm showed that the interference level to FSS operations during these phases will remain well under 1% ΔT/T most of the time, and that techniques similar to how NGSO operations will be protected can be used, as needed.