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July 15, 2016

*Via Electronic Filing*

Ms. Marlene H. Dortch, Secretary  
Federal Communications Commission  
445 12th Street SW  
Washington DC 20554

**Re: *Ex Parte* Presentation  
Higher Ground LLC, Blanket License Application for C-band Mobile  
Earth Terminals; IBFS File No. SES-LIC-20150616-00357**

Dear Ms. Dortch:

On Wednesday, July 13, 2016, representatives from the Fixed Wireless Communications Coalition, Inc. (FWCC) and the Federal Communications Commission (FCC) met to discuss the FWCC's positions in the above-referenced matter. These positions were detailed in the FWCC's written *ex parte* presentation filed previously in this proceeding on June 8, 2016 and in the attached presentation handouts given to meeting participants. During the meeting, participants also raised the option of a limited or conditional waiver. The FWCC would be amenable to considering this option over a full scale launch of an untested unilateral coordination mechanism.

In addition to the undersigned, the following individuals were in attendance on behalf of the FWCC: Mitchell Lazarus, Fletcher, Heald & Hildreth, PLC; Larrie Sutliff, AT&T; and Joe Marzin, Comsearch.

The following individuals were in attendance on behalf of the FCC: Blaise Scinto and Stephen Buenzow (by phone) from the Wireless Telecommunications Bureau's Broadband Division; Jose Albuquerque, Kerry Murray, Paul Blais (by phone), Chip Fleming, Cindy Spiers, Hsing Liu and Cally Richter (legal intern) from the International Bureau's Satellite Division; and Jennifer Gilsean from the International Bureau's Office of the Bureau Chief.

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Please do not hesitate to contact the undersigned for any questions.

Respectfully submitted,



Cheng-yi Liu  
Counsel for the Fixed Wireless  
Communications Coalition, Inc.

Attachment

cc (via email):

Meeting Participants  
Adam D. Krinsky, Counsel for Higher Ground LLC  
Susan H. Crandall, Intelsat Corporation  
David E. Meyer, National Spectrum Management Association  
Tiffany West Smink, CenturyLink

**Fixed Wireless Communications Coalition  
opposition to  
Higher Ground LLC, Blanket License Application  
for C-Band Mobile Earth Terminals**

**IBFS File No. SES-LIC-20150616-00357, call sign E150095**

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**July 13, 2016**

## About the FWCC

- ✦ Companies, associations, and individuals interested in terrestrial fixed microwave communications
- ✦ Formed in 1998; speaks for the fixed service community
- ✦ Active in 65+ FCC proceedings plus NTIA, FAA, GAO, courts
- ✦ Membership includes:
  - microwave equipment manufacturers
  - fixed microwave engineering / frequency coordinating firms
  - licensees of fixed microwave systems (and/or associations)
  - communications service providers (and/or associations)
  - major end users (railroads, public utilities, petroleum and pipeline, public safety agencies) and/or associations
  - backhaul providers, communications carriers
  - telecommunications attorneys and engineers.

## Higher Ground Proposal

- ✦ Transmit from consumer mobile satellite devices in the 5925-6425 MHz fixed service band
- ✦ Coordinate unilaterally by using ULS data on fixed links to predict interference.



## Current Uses of 6 GHz Fixed Service Band

- ✦ Many applications are critical to safety of life and property
  - typical availabilities of 99.999+ percent
- ✦ Some 6 GHz applications:
  - pipeline control
  - operation of electric grid
  - synchronizing movement of railroad trains
  - public safety backhaul
  - real-time financial and market data
  - urgent business data
  - Internet and telephone
- ✦ High availabilities are expensive: the last few dB can cost many thousands.

## Existing Frequency Coordination

- ✦ Relies on *bilateral* notice-and-response protocol
  - applicant circulates detailed Prior Coordination Notice (PCN)
  - potential victim has opportunity to review and object
  - facilitates post-licensing checks on potential interference
- ✦ All but foolproof for 40 years: virtually no interference between fixed systems
- ✦ Interference control for high-availability fixed service requires prior calculation, coordination, agreed-upon rules
- ✦ Lower 6 GHz has effective spectrum sharing (and FCC rule success)
  - 22,243 fixed microwave links
  - 2,110 fixed satellite earth stations.

## Higher Ground Proposal Falls Short

- ✦ Higher Ground seeks to bypass existing frequency coordination
- ✦ Approach is wholly unilateral: system makes its own decision on whether to transmit
  - no review by third parties
  - no way for victim to head off interference
  - no recourse if interference occurs
- ✦ System is complex with many moving parts, many opportunities for failure
- ✦ No way to detect, identify, or discontinue interference that occurs.



## Reliance on Consumer Equipment

- ✦ Higher Ground system will use consumer devices in very large numbers
  - subject to mishandling and abuse
  - subject to breakdowns that are common in consumer electronics
- ✦ Device will check orientation of directional antenna using sensors in attached cell handset
  - makes critical interference protection dependent on a feature designed for casual games, etc.

## Specific Concerns – 1

- ✦ ***Conflicting incentives.*** Higher Ground's business model relies on completing most communications
  - company has every incentive to please customers despite risk of interfering
- ✦ ***Adjacent channel interference.*** Fixed service receivers (like others) can be vulnerable to interference from adjacent channels
  - Higher Ground has said its algorithms will not be aggressive on this issue.
- ✦ ***Lack of recourse.*** Even if a fixed service operator could prove Higher Ground caused interference, it will have no recourse
  - harmful interference should lead to revocation of Higher Ground's waiver
  - but not likely in practice.

## Specific Concerns – 2

- ✦ ***Errors in ULS database.*** ULS has known errors (*e.g.*, in tower locations) that could lead Higher Ground to cause interference
  - licensees are responsible for accuracy—but proposal would greatly worsen consequences of even small errors
- ✦ ***Overly Generalized Interference Model.*** Higher Ground’s model for calculating interference uses a “one-size-fits-all” approach
  - fixed service band is a complex RF environment
  - requires hands-on, individualized frequency coordination.

## Specific Concerns – 3

- ✦ ***Attributing interference.*** Even if Higher Ground seriously degrades fixed service operations, operators will have no way to associate the interference with Higher Ground
  - problem made worse by rarity of fixed service outages
  - no way to detect, report, or discontinue interference
- ✦ ***Suitable bands available.*** The Commission has allocated Mobile Satellite Service bands specifically for Higher Ground's type of application
  - C-band's lower cost to Higher Ground does not justify risk of interference to fixed service.



## “Statistical Ceiling of Interference” is Suspect

- ✦ Higher Ground says worst-case “uncoordinated” interference is one incident per 13 months for every northward-facing fixed receiver
- ✦ Calculation rests on unrealistic assumptions:
  - each mobile device averages only 5 messages per month
  - mobile device messages occur evenly over time
  - mobile devices are spread evenly over the country
  - pointing of mobile devices is random over 360 degrees
  - fixed receivers are spread evenly over the country
  - pointing of fixed receivers at any location is random
- ✦ Concentrations of mobile devices or fixed receivers (or both) will result in far more frequent interference.



## Bad History of Mobile Use in Fixed Band

- ✦ 2005: FCC authorized C-band earth stations on moving ships
  - “Earth Stations aboard Vessels” (ESVs)
  - required full bilateral frequency coordination
- ✦ Fixed service operators experienced interference from ESVs
  - sources went undetected for years
  - discovered ESVs as cause only accidentally
- ✦ Illustrates the high risk from mobile devices in fixed bands
  - even with best efforts at frequency coordination.

## Waiver Proceeding Not Appropriate

- ✦ Proposal raises novel issues and departures from precedent
- ✦ Under waiver, first test would come with widespread deployment
- ✦ Mobile use needs detailed technical rules for protection to the fixed service
  - plus procedures to promptly ameliorate any interference that occurs
  - plus sanctions in the event that Higher Ground causes harmful interference
- ✦ Changes of this scope and consequence require a rulemaking
  - ✦ should include stakeholder discussion and testing comparable to TV White Space proceeding
- ✦ Adoption of rules would also open band to competition for mobile satellite service.

**Thank you!**

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