Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the matter of	)	
	)	
Application of RaySat, Inc. for Authority to	)	File No. SES-LIC-20060629-01083
Operate 4,000 In-Motion Mobile Satellite	)	SES-LIC-20060629-02248
Antennas in the 14.0-14.5 GHz and 11.7-	)	SES-LIC-20060629-02249
12.2 GHz Frequency Bands	)	SES-LIC-20060629-02250
	)	SES-LIC-20060629-02251
	)	SES-LIC-20060629-02252
	)	

REPLY TO OPPOSITION

ViaSat, Inc. ("ViaSat") replies to the Opposition of Raysat, Inc. ("Raysat"), in which Raysay responded to ViaSat's Petition for Reconsideration or Clarification ("Petition") of the *Raysat Authorization Order*.[1]

I. INTRODUCTION AND SUMMARY

In the *Order*, the International Bureau granted Raysat authority to operate four hundred mobile earth terminals ("METs") to offer a Land Mobile-Satellite Service ("LMSS") using fixed satellite service ("FSS") Ku band frequencies on a secondary, non-interference basis.[2] ViaSat filed the Petition requesting that the Bureau: (i) clarify that the data logging requirement in the *Order* encompasses all of the parameters included in the data logging requirement for earth stations on vessels ("ESVs") specified in Section 25.222(c)(1) of the Commission's rules, and (ii) require Raysat to file a report with the Bureau one year after commencing commercial operations.

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1 *Application of Raysat, Inc. for Authority to Operate 4,000 In-Motion Mobile Satellite Antennas in the 14.0-14.5 GHz and 11.7-12.2 GHz Frequency Bands*, Order and Authorization, IBFS File No. SES-LIC-20060629-01083, DA 08-401 (Feb. 15, 2008) ("*Raysat Authorization Order*" or "*Order*").

2 *Id.* at ¶ 1.

In responding to ViaSat's Petition, Raysat argues that the data logging requirement in the *Order* is consistent with LMSS precedent, and that ViaSat's proposed reporting condition is unnecessary because the *Order* already requires Raysat to log information about interference events. However, Raysat misses the main point of ViaSat's Petition: additional reporting and logging conditions are warranted (i) to identify the source of interference in the first instance, and (ii) because Raysat has not yet deployed its novel land-mobile network and antenna design on a commercial basis. As ViaSat explained in the Petition, clarifying the *Order* in these limited respects would ensure that the Commission and other interested parties can appropriately respond to potential instances of interference, and would confirm that Raysat's antenna technology is capable of operating successfully within the context of a broader commercial deployment. Accordingly, the Commission should grant the Petition, which does not alter any of Raysat's operational authority, but merely would require that Raysat maintain and provide the same data about its nascent mobile technology that other similarly-situated licensees are required to maintain and provide.

II. CLARIFICATION OF THE DATA LOGGING REQUIREMENT IS NECESSARY AND APPROPRIATE

In its Opposition, Raysat asserts that Viasat's proposal that Raysat log data about the transmit frequency, channel bandwidth and satellite used by a given MET is unwarranted because the Bureau intentionally made the data logging requirement in the *Order* narrower than the requirement that applies to ESVs.[3] To the contrary, while the Bureau considered the applicability of the data logging requirements in the ESV rules, nothing in the *Order* distinguishes Raysat's LMSS operations from ESV operations, or otherwise explains why a

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[3] Opposition at 3.

narrower data logging requirement should apply to Raysat's system.[4] Under Section 25.222(c)(1) of the Commission's rules, ESVs are required to log data not only on the location of each MET, but also on the transmit frequency, channel bandwidth and satellite used.[5] The pending notice of proposed rulemaking regarding vehicle-mounted earth stations ("VMES") cites the ESV data logging requirement, including specifically the requirement to log transmit frequencies, channel bandwidth and the satellite used, and requests comment on whether the same requirement should apply to VMES.[6]

Information regarding a MET's frequency, channel bandwidth and time of day is necessary to identify the source of any observed interference. It is not enough, as Raysat suggests, to try to record that information after the fact, in response to interference that has already occurred.[7] That information needs to be recorded and maintained on an ongoing basis so that the source of interference may be identified in the first instance. Thus, clarifying the *Order* to specify that Raysat must log these data points would be consistent with the Bureau's rationale for imposing a data logging requirement on Raysat, namely that "Raysat['s] proposed operations will be transitory in nature and . . . that maintaining logs on METs operations will help identify and resolve any interference concerns raised by such operators."[8] Therefore, ViaSat's requested

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4 *See Raysat Authorization Order* at ¶ 36. *See also id.* at ¶ 36 n.95 (explicitly referencing data logging requirements of 47 C.F.R. § 25.222(c)(1)).

5 *See* 47 C.F.R. § 25.222(c)(1).

6 *See Amendment of Parts 2 and 25 of the Commission's Rules to Allocate Spectrum and Adopt Service Rules and Procedures to Govern the Use of Vehicle-Mounted Earth Stations in Certain Frequency Bands Allocated to the Fixed-Satellite Service*, Notice of Proposed Rulemaking, IB Docket No. 07-101, FCC 07-86, at ¶¶ 62-64 (May 9, 2007) ("*VMES NPRM*").

7 Opposition at 3.

8 *Raysat Authorization Order* at ¶ 35.

clarification of the data logging condition is fully consistent with the Bureau's purpose in adopting a data logging requirement.

III. THE PROPOSED REPORTING CONDITION IS CONSISTENT WITH CONDITIONS ON SIMILARLY-SITUATED MOBILE SERVICES

Raysat opposes ViaSat's proposal that, like other mobile services in FSS bands (such as Aeronautical Mobile Satellite Service ("AMSS")), Raysat file a report regarding its commercial LMSS operations one year after commencing service. Raysat argues that "significant distinctions between AMSS and LMSS operations" somehow "preclude imposition of requirements designed for one service on the other."[9] As an initial matter, any differences between AMSS and LMSS operations actually exacerbate the potential for harmful interference from LMSS operations; the operating environment for AMSS systems operating in FSS bands is far more forgiving than the operating environment for land-mobile users. Aircraft travel along stable, predictable routes, while vehicles travel along more dynamic routes, with frequent changes in direction and acceleration.

More fundamentally, the Commission is moving toward a regulatory framework for mobile uses of FSS frequencies that is largely consistent among mobile earth station operations on vessels, aircraft and land-based vehicles. In the pending proceedings to adopt service rules for aeronautical earth stations and VMES terminals, the Commission has often cited the current ESV rules as its baseline for AMSS and VMES rules.[10] Harmonizing the regulatory frameworks for these services, which use similar antenna pointing technologies, is appropriate. The consistent treatment of similarly-situated systems would allow manufacturers and service

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9 Opposition at 4.

10 *See gen. VMES NPRM; Service Rules and Procedures to Govern the Use of Aeronautical Mobile Satellite Service Earth Stations in Frequency Bands Allocated to the Fixed Satellite Service*, 20 FCC Rcd 2906 (2005).

providers to develop mobile systems capable of functioning across these environments, and would promote the economic viability of these systems. The reporting requirement that ViaSat proposes is consistent with the conditions that the Commission has imposed on other secondary mobile applications in the Ku band.

Contrary to Raysat's assertions, Raysat's planned land-mobile operations closely parallel the aeronautical mobile operations the Bureau has previously authorized[11] in several important respects. Thus, the policy rationale for imposing a reporting condition in the AMSS context is equally applicable in the LMSS context. While Raysat claims that a reporting condition is unnecessary because its system design does not involve complex and untested network control and other features,[12] the Bureau recognized in the *Raysat Authorization Order* that Raysat's mobile operations have the potential to cause harmful interference to other users.[13] Regardless of the complexity (or simplicity) of the network management systems or other operational parameters of Raysat's system, Raysat's antenna technology employs a novel design that has been tested only in an experimental context, and never on a broad commercial scale.

Raysat's other attempt to distinguish its operations from AMSS systems is similarly unavailing. Raysat claims that it "has conducted Ku-band LMSS operations for several years under experimental authority without a single reported case of interference."[14] The Commission

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11 *See, e.g., ARINC Incorporated, Application for Blanket Authority for Operation of Up to One Thousand Technically Identical Ku-Band Transmit/Receive Airborne Mobile Stations Aboard Aircraft Operating in the United States and Adjacent Waters*, 20 FCC Rcd 7553, at ¶ 56 (2005) ("*ARINC Order*").

12 Opposition at 4.

13 *Raysat Authorization Order* at ¶ 37.

14 Opposition at 4.

rejected a similar claim in subjecting ARINC's AMSS authorization to a reporting requirement.[15] The Bureau should reach the same result here. In fact, the Bureau appropriately recognizes in the *Order*, as it did in the *ARINC Order*, that data derived from Raysat's previously authorized experimental operations are insufficient to ascertain the scope of possible interference resulting from wide deployment in commercial operations.[16] Raysat's system as a whole is untested and has not produced sufficient operational data in a commercial environment. In an experimental facility, METs are operated by trained staff who are sensitive to the requirement to operate the antenna and modem within authorized parameters. By contrast, in a broad, commercial deployment, the METs may be operated by members of the public who may be relying on a network operator to ensure compliance with regulatory requirements. Imposing a reporting requirement in the LMSS context, as the Commission did in the AMSS context, would allow the Commission to confirm that Raysat's network management capabilities can sufficiently limit or disable METs that are not operated within authorized parameters.

Further, the Commission imposed a reporting requirement on AMSS licensees, in part, because service rules for AMSS in Ku band FSS frequencies had not yet been adopted. The same situation exists here. The Commission is considering, but has not yet adopted, service rules for land-based METs in the Ku band FSS frequencies that Raysat will employ,[17] and as such, should also require Raysat to provide a report regarding its first year of commercial operations on a secondary, non-interference basis. The proposed reporting requirement would give the Commission the opportunity to gain comfort regarding the commercial deployment of Raysat's secondary use of FSS spectrum.

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15 *See ARINC Order* at ¶ 56.

16 *Raysat Authorization Order* at ¶ 37; *ARINC Order* at ¶ 56.

17 *See VMES NPRM.*

Finally, Raysat's argument that ViaSat's proposed reporting requirement is unnecessary in light of other provisions of the *Order* misses the point. The data logging requirement that Raysat references serves a fundamentally different purpose than the reporting requirement would serve. The data logging requirement is an ongoing requirement imposed to facilitate the identification and resolution of particular interference events, while the reporting condition would be a one-time requirement intended to verify that Raysat's system is actually capable of operating successfully in a commercial environment in a manner consistent with the Commission's rules and a two-degree spacing environment.[18]

ViaSat urges the Bureau to require Raysat to file a report with the Bureau one year after commencing commercial operations, addressing installed equipment configurations, EIRP compliance, compliance with assigned bandwidth/emission designators, and reported interference events. These operating parameters and other information in the report would be consistent with the type of public information provided in a system application and in Raysat's product marketing materials,[19] and would not contain competitively sensitive information, as Raysat suggests. However, to the extent that Raysat believes that any information required in such a report would be competitively sensitive, Raysat could request confidential treatment of that information pursuant to Section 0.459 of the Commission's rules.[20] Adding such a reporting condition would allow the Bureau and potentially affected users of the Ku band to verify that

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[18] The Bureau imposed the data logging requirement to "help identify and resolve any interference concerns raised by [other Ku band] operators." *Raysat Authorization Order* at ¶ 35. In contrast, as ViaSat explained in the Petition, the reporting condition "would allow the Bureau and potentially affected users of the Ku band, such as ViaSat, to verify that Raysat's LMSS network actually complies with the Commission's rules when its METs are deployed and are operating on a widespread commercial basis." Petition at 4.

[19] Identification of the antenna, antenna controller and modem used in Raysat's systems is generally publicly available information. *See* Attachment A.

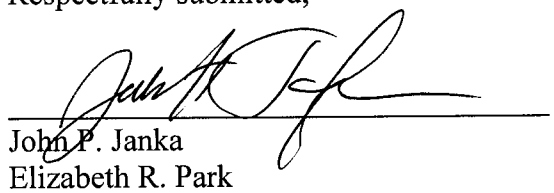
[20] 47 C.F.R. § 0.459.

Raysat's LMSS network is operating in compliance with the Commission's rules and the *Order* when its METs are deployed on a widespread commercial basis.

* * * * *

For the foregoing reasons, ViaSat respectfully requests that the Bureau grant the Petition and modify the *Order* to incorporate the requested clarification and condition.

Respectfully submitted,



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Counsel for ViaSat, Inc.

April 10, 2008

ENGINEERING INFORMATION CERTIFICATION

I hereby certify that I am the technically qualified person responsible for reviewing the engineering information contained in the foregoing submission, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this pleading, and that it is complete and accurate to the best of my knowledge and belief.

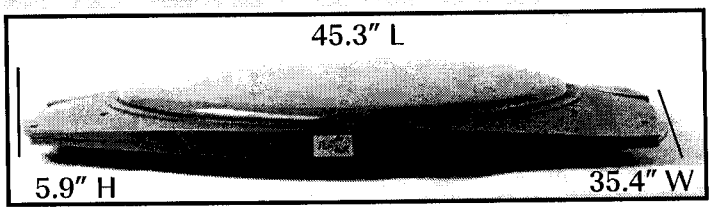
Daryl T. Hunter, P.E.
ViaSat, Inc.
6155 El Camino Real
Carlsbad, CA 92009-1699

Dated: April 10, 2008

ATTACHMENT A

StealthRay™

In-Motion Satellite Communications



PRODUCT DESCRIPTION:

The StealthRay™ is a breakthrough in two-way satellite communication. The StealthRay's™ low profile (5.9"), array antenna system is designed to provide communications for vehicles on-the-move. The innovative antenna system automatically searches for and acquires the designated satellite signal and maintains pointing via automatic tracking and control of the azimuth, elevation and polarization angles while the vehicle is in motion.

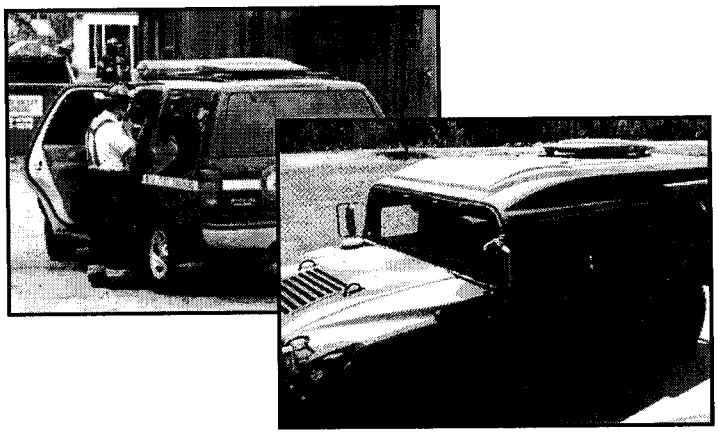
The StealthRay™ offers valuable utility across a wide range of applications, including emergency communications, since it can provide public safety authorities and first responders with a high-speed satellite communications link to moving vehicles independent of terrestrial infrastructures that are susceptible to local service interruptions, natural disasters and sabotage. Since it does not rely on terrestrial networks, it also offers applications for industries typically operating across remote geographic areas unserved by wireless carriers as well as military operations. Those industries most notably include energy, natural resources, transportation and conservation.

SYSTEM COMPONENTS:

The StealthRay™ consists of a low-profile, vehicle roof-mounted array antenna connected to a controller and a satellite modem inside the vehicle.

The roof mounted antenna includes the BUC (Block Up Converter) and the LNB. The controller supplies the power to the antenna and controls the antenna movements.

Additional networking equipment such as a router, Wi-Fi access point, as well as encryption systems are optional for creating a mobile, secure, in-motion hotspot.



SYSTEM OPERATION:

- **No manual pointing is required**
  Using GPS signals to determine its location, the StealthRay™ automatically acquires and tracks the satellite.
- **On-the-move automatic re-peaking**
  Built-in gyros allow fast recovery from line-of-sight blockages. The antenna uses a hybrid mechanical and electronic scanning process to maintain pointing accuracy.
- **Adjacent satellite interference protection**
  In the event the antenna pointing is off by more than 0.5 degrees, the return link transmission is automatically muted until the pointing error is corrected by the antenna's sophisticated tracking system.
- **Modem compatibility**
  The StealthRay™ system is modem agnostic and will support all RaySat authorized SCPC satellite modems and VSATs.

CABLING:

The roof mounted antenna is connected with three cables to the controller and modem within the vehicle:

- Two RJ-58 cables using F-type connectors connect the antenna to the satellite modem (transmit signal and receive signal).
- One RJ-58 control cable using TNC connectors connects the antenna to the controller (for DC power and control data).

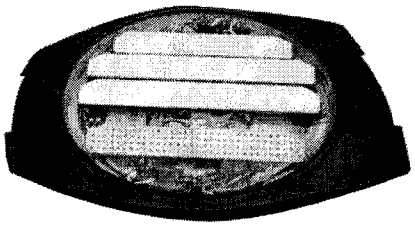
APPLICATIONS:

- High-speed Com-on-the-Move (COTM) for military vehicles and operations
- Emergency communications for federal, state and local first responders
- High-speed communications for trains and other commercial enterprise customers
- High-speed Internet access for moving vehicles such as motor-homes, buses, vans and SUV's

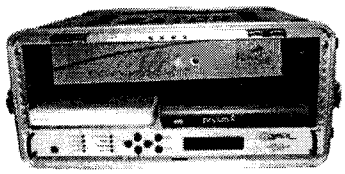
RAYSAT ANTENNA SYSTEMS

8460-D Tyco Road, Vienna, VA 22182 ❖ www.raasys.com ❖ 800.561.9280 703-584-3770

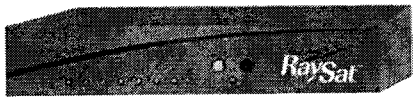
StealthRay™ Specifications

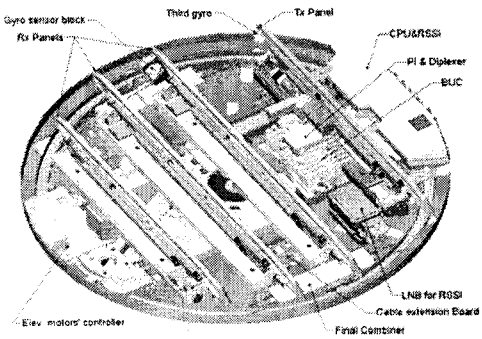


Antenna



Rack with complete system





KEY FEATURES

- Low profile 5.9" height - blends into the vehicle and can include matching color options
- Simple installation on any luggage rack, flat roof or under the roof with a false ceiling; only the radome is visible
- Stand alone unit, complete with all required RF hardware including Block Up Converter (BUC)
- Operates off a vehicle's standard 12V DC power supply with minimal power consumption
- Auto satellite tracking / in-motion operation / hands free operation
- Compatible with any Ku-band satellite and is modem agnostic

ANTENNA PERFORMANCE AND DATA RATES *

Receive (forward link)	Up to 15Mbps
Transmit (return link)	64 Kbps - 384 Kbps (internal 3 watt BUC)
	512 Kbps - 2Mbps (external BUC)

*** System performance varies as a function of the satellite link (beam EIRP and G/T) and the satellite modem parameters.**

ANTENNA PHYSICAL CHARACTERISTICS

Dimensions	45.3" x 35.4" x 5.9"
Weight	66 lbs total (antenna - 62lbs, controller - 4lbs)
Electrical interfaces	
Power supply	30V DC provided by the antenna controller
Output\Input impendence	50 ohms
Environmental	
Ambient temperature range	Operational: -13° F to 122° F ambient
Relative Humidity	0-100% condensing
Mobile Platform Ground Speed	Operational up to 220 mph

ANTENNA CHARACTERISTICS

Frequency range		
Receive	11.7 - 12.75 GHz	
Transmit	14.0 - 14.5 GHz	
Polarization	Orthogonal linear (auto polarization control)	
Uplink EIRP	32 dBW	
Gain	TX: 27 dBi	RX: 29.3 dBi
G/T	7.6 dB/°K @ 30°	
Sidelobe level	-12 dB	
TX Cross polarization	> 30 dB	
Azimuth / elevation beam coverage	360° continuous Az	25° - 70° El
IF input / output	L-Band 950 - 2150 MHz	

SIGNAL ACQUISITION AND TRACKING

Signal acquisition & lock	Automatic <60° sec
Polarization angle adjustment	Automatic
Tracking speed	60°/sec
Re-acquisition	< 1 sec for blockage length up to 3 min
Azimuth tracking accuracy	< 0.3° nominal
Elevation tracking accuracy	< 0.35°
Polarization adjustment accuracy	< 1°

ANTENNA CONTROL UNIT (ACU)

Power supply	12V DC
Power consumption	5A (ACU & antenna w/ internal BUC)
System interface	CLI over RS-232
Modem interface	Proprietary over RS-232

RaySat Antenna Systems, LLC • 8460-D Tyco Rd. • Vienna, VA 22182 • 703.584.3770 • www.raasys.com

CERTIFICATE OF SERVICE

I, Jarrett S. Taubman, hereby certify that on this 10th day of April, 2008, served a true copy of the foregoing Reply to Opposition to by first class mail, postage pre-paid upon the following:

Carlos M. Nalda
Mintz Levin Cohn Ferris Glovsky and Popeo, P.C.
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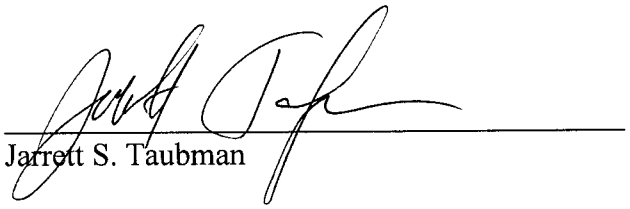

Jarrett S. Taubman