MSV
Mobile Satellite Ventures LP

Lon C. Levin
Vice President

PHONE: 703 390-2717
FAX: 703 390-2777
EMAIL: llevin@msvlp.com

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January 7, 2005

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

Re: Mobile Satellite Ventures Subsidiary LLC
***Ex Parte* Presentation**
IB Docket No. 01-185
File No. SAT-MOD-20031118-00333 (ATC application)
File No. SAT-AMD-20031118-00332 (ATC application)
File No. SES-MOD-20031118-01879 (ATC application)

Dear Ms. Dortch:

Mobile Satellite Ventures Subsidiary LLC ("MSV") hereby files the attached study demonstrating a technique for further reducing the potential interference to adjacent-channel mobile terminals in airports and on waterways while relaxing the limits on ATC base station power flux density.

MSV has redacted Figures 1, 2, and 3 from the attached study because they contain information relating to the ongoing international L-band frequency coordination process which is confidential among the parties to that coordination. The Commission has acknowledged the confidentiality of information relating to this coordination process.[1] MSV has served a non-redacted copy of this study on Inmarsat Ventures Ltd., which is also a party to the L-band coordination.

Please direct any questions regarding this matter to the undersigned.

Very truly yours,

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Lon C. Levin

[1] Comsat Corporation, et al., File No. ITC-97-222, FCC 01-272, *Memorandum Opinion, Order and Authorization*, at ¶¶ 106-107 (Oct. 9, 2001).

CERTIFICATION

I, Dr. Peter D. Karabinis, Vice President & Chief Technical Officer of Mobile Satellite Ventures Subsidiary LLC ("MSV"), certify under penalty of perjury that:

I am the technically qualified person with overall responsibility for preparation of the information contained in the foregoing. I am familiar with the requirements of the Commission's rules, and the information contained in the foregoing is true and correct.

Executed on January 5, 2005

Dr. Peter D. Karabinis
Vice President & Chief Technical Officer

cc: Donald Abelson
Jim Ball
William Bell
Richard Engelman
Chip Fleming
Howard Griboff
Karl Kensinger
Paul Locke
Kathyrn Medley
Robert Nelson
Sean O'More
Roderick Porter
Steve Spaeth
David Strickland
Cassandra Thomas
Thomas Tycz
John Janka, Counsel for Inmarsat

Consequently, subject to an MSV ATC base station deployment that, over all sectors facing and serving navigable waterways, adheres to the constraints of Figure 3, 8 dB of relaxation in the PFD limits established by the Commission in the *ATC Order* (and later corrected by MSV)[6] is appropriate while continuing to protect Inmarsat terminals that are operating in navigable waterways against harmful overload interference.

Thus, the Commission can establish additional flexibility in PFD limits or safe harbor distances for airports and navigable waterways subject to the specific ATC base station deployment constraints presented above. The additional flexibility in PFD limits or safe harbor distances will offer MSV additional flexibility to deploy its hybrid satellite/ATC network, in certain areas, with less capital expenditure while adequately protecting Inmarsat terminals against harmful overload interference. The Commission may thus authorize MSV with the flexibility to (i) offer ATC service near airports and navigable waterways subject to the constrained deployment of frequencies as described above, with 8 dB of additional flexibility in PFD limits or corresponding reductions in safe harbor distances, or (ii) offer ATC service near airports and navigable waterways without any constraints in carrier deployment while satisfying the stricter PFD limits or safe harbor distances that have already been established by the Commission.

[6] *See* MSV ATC Application at 21-22; *see also* MSV *Ex Parte* letter, IB Docket No. 01-185 (November 18, 2003).

Additional Protection for Terminals Operating in Open Areas of Airports and Navigable Waterways

ATC base station emissions that are aimed toward a harbor/navigable waterway or an airport may potentially overload satellite terminal receivers that are operating in such areas. Based on this conclusion, the Commission established PFD limits and safe harbor distances that, when adhered to by ATC base station deployments, protect land-transportable, AMS(R)S and GMDSS terminals.[1] An overload condition may produce Inter-Modulation (IM) products within a receiver's front-end that may fall within the receiver's operating frequencies. MSV has found that near airports and navigable waterways, the potential for any harmful IM interference may be further reduced by constraining ATC base station deployments to radiate only specific subsets of MSV's frequencies. Base station sectors that are facing toward an airport or a navigable waterway may be constrained to radiate only two or three carrier frequencies, judiciously chosen from MSV's ensemble of frequencies, such that the third-order IM products do not impact major portions of Inmarsat's spectrum. Specifically, it has been found that limiting the number of carrier frequencies that may be deployed by ATC base station sectors facing and serving navigable waterways or airports to no more than three, will protect major portions of Inmarsat's aeronautical and maritime spectrum to a much greater extent than a deployment that uses all available frequencies. As such, a limited number of carrier frequencies (up to three) may be radiated at higher power levels. Putting it differently, subject to the constrained deployment methodology described herein below, the Power Flux Density (PFD) limits for airports and navigable waterways and/or the separation distances established by the commission may be relaxed.

Specification of constrained deployment and measurements: Figure 1 depicts the current allocation of MSV and Inmarsat spectrum. In accordance with the selection criteria described above, three 1.25 MHz cdma2000 (1XRTT) carriers are identified in Figure 1 for ATC deployment near airports and navigable waterways.[2] Given the location of Inmarsat aeronautical and maritime spectrum, it has been found by laboratory measurements that utilization of the carrier frequencies identified in Figure 1 optimally protects Inmarsat terminals that may be communicating from within airport open spaces or from maritime vessels in proximity to the shore.

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[1] *See ATC Order*, Appendix C2 at 219.

[2] The approach also works with any other air interface protocol.

established by the Commission in the *ATC Order* (and later corrected by MSV)[4] is appropriate while continuing to protect Inmarsat terminals that are operating in airport open spaces (using upper L-band spectrum[5]) against harmful overload interference.

Figure 3 - GAN Terminal Overload Threshold for 3 CDMA Interfering Carriers

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Constrained deployment near navigable waterways: From Figure 3 we observe that by limiting MSV's deployment near navigable waterways to only three carriers, as is assumed in Figure 3, a GAN terminal operating over Inmarsat's maritime spectrum (at any frequency lower than 1540 MHz) would experience overload at a received interference level of -56 dBm (while operating at edge-of-coverage and without the aid of power control) or at -52 dBm if it operated under more favorable link conditions of 6 dB more desired signal power (as would be provided by power control and/or by a more favorable geographic location). As stated earlier, these overload thresholds (of -56 dBm and -52 dBm) are 4 dB and 8 dB greater, respectively, relative to the -60 dBm overload threshold that was assumed by the Commission in the *ATC Order*. The Inmarsat GAN family of terminals (as well as all other modern Inmarsat equipment including R-BGAN, BGAN, Mini-M, M, and B terminals) is designed with power control capability.

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[4] *See* MSV ATC Application at 21-22; *see also* MSV *Ex Parte* letter, IB Docket No. 01-185 (November 18, 2003).

[5] Note that if a terminal is operating using lower L-band spectrum, the protection is significantly greater, as can be seen from Figure 2.

Figure 1 - Current Region 2 Spectrum Allocations for MSV and Inmarsat

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Figures 2 and 3 below summarize laboratory measurements of overload threshold as a function of forward-link operating frequency of a satellite terminal. The satellite terminal is an Inmarsat GAN terminal.[3] The power level at which overload occurs is referenced to the terminal's antenna output port (input to the terminal's front-end electronics) and the overload threshold is defined by the Bit Error Rate (BER) threshold of 10^{-4}. Figure 2 presents results for the case where the two lowest MSV carriers identified in Figure 1 are deployed. Figure 3 presents results for the case where all three MSV carriers identified in Figure 1 are deployed. Measurements were conducted at two levels of satellite terminal forward-link carrier:

1) A "baseline" level corresponding to a nominal edge-of-coverage forward-link carrier EIRP, and

2) A higher forward-link carrier level (+6 dB relative to baseline) to simulate the effect of additional power being delivered to the satellite terminal (as may be the case when the satellite terminal is operating in a more favorable geographic position and/or is receiving more power via power control).

Also, two configurations of CDMA carrier power levels were evaluated:

A) All interference carriers used are of equal power (solid lines), and

B) One interference carrier (out of the two or three) having 6 dB more power than the other(s) (dashed lines).

[3] The measurements were conducted at MSV's facilities. MSV has procured and used the same Inmarsat system emulation tools that the Commission has used to perform measurements of overload.

The Figures plot received power at satellite terminal's antenna output port (input to the terminal's front-end electronics) vs. forward-link frequency of operation of the satellite terminal.

Figure 2 - GAN Terminal Overload Threshold for 2 CDMA Interfering Carriers

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Constrained deployment near airports: It is interesting to observe from Figure 2 above that by limiting MSV's deployment near airports to only two carriers, as is assumed in Figure 2, a GAN terminal operating over the portion of Inmarsat's aeronautical spectrum at a frequency lower than about 1547 MHz would experience overload at a received interference level of -56 dBm (while operating at edge-of-coverage and without the aid of power control) or at -52 dBm if it's operating under more favorable link conditions of 6 dB more power (as would be provided by power control and/or a more favorable geographic location). The overload levels of -56 dBm and -52 dBm are 4 dB and 8 dB greater, respectively, relative to the -60 dBm overload threshold that was assumed by the Commission in the *ATC Order*. The Inmarsat GAN family of terminals (as well as all other modern Inmarsat equipment including R-BGAN, BGAN, Mini-M, and M terminals) is designed with power control capability. Consequently, subject to an MSV ATC base station deployment that, over all sectors facing and serving airports, adheres to the constraints of Figure 2, 8 dB of relaxation in the PFD limits