Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 2 and 25 to Implement the Global Mobile Personal Communications by Satellite (GMPCS) Memorandum of Understanding and Arrangements	)	IB Docket No. 99-67
	)	
Petition of the National Telecommunications and Information Administration to Amend Part 25 of the Commission's Rules to Establish Emissions Limits for Mobile and Portable Earth Stations Operating in the 1610-1660.5 MHz Band	)	RM No. 9165

Regarding the Reply Comments of L/Q Licensee,Inc., Globalstar, L.P. and Airtouch Satellite Services U.S., Inc. dated 21 July 1999.

Major factual errors in the reply comments of L/Q Licensee,Inc., Globalstar, L.P. and Airtouch Satellite Services U.S., Inc. ("L/Q et. al.") dated 21 July 1999 require comment and we would urge the FCC to consider our rebuttal.

1: L/Q et.al. makes much of purported GPS unreliability in ground mobile applications and bases their claims[1] on shadowing parameters from LSC's web site[2]. GPS works quite well in the ground mobile environment, as evidenced by millions of current users. The referenced web page is NOT even about GPS. Nowhere does this page mention GPS and in fact the page is about the affects of ground to ground terrestrial propagation on cellular systems operating in another frequency band. GPS is a satellite based system. The referenced page has no bearing on the GMPCS discussion and any one with even a passing familiarity with GPS signal propagation would immediately recognize this. Nonetheless L/Q et. al. repeatedly makes claims about GPS performance based on wholly inappropriate propagation models.

2: L/Q et. al. claims[3] that LSC's analysis of GPS receiver performance is superficial. They then immediately demonstrate how ignorant of GPS receiver internals they are by saying that phaselock is not maintained in transitioning from satellite to satellite in a Multiplex set. Multiplex receivers DO maintain phaselock as they transition from satellite to satellite. See any introductory text on GPS or U.S. utility patents 4,485,383 & 4,468,793 for details.

---

[1] L/Q et. al. at section 1.2 of their technical appendix.
[2] Specifically at http://ourworld.compuserve.com/homepages/loganscott/diversity2.htm
[3] L/Q et. al. at section 2.1 of their technical appendix.

3: L/Q et. al. claims[4] that *"As an SV moves higher in the sky, its received signal strength increases (4 dB at zenith)…"*. This is not true, GPS signal strength actually decreases as you approach zenith. See the GPS signal specification ICD-GPS-200C, 25 September, 1997 figure 6-1.

4: L/Q et. al. at section 2.1 of their technical appendix claims[5] that a 30 degree roll angle is unreasonable for a GPS receiver. Evidently L/Q et. al. are unfamiliar with handheld GPS equipment and the "throw it on the dashboard" mounting procedure in widespread use. Furthermore, it is clear that L/Q et. al. have no actual field experience with GPS since they make the erroneous statement several times[6] that GPS does not work in the interior of vehicles without special external antenna mounting provisions. GPS works quite well inside most vehicles with no special provisions.

5: L/Q et. al. do not seem to be familiar with elementary Dilution of Precision concepts. In section 2.1 of their technical appendix they state:

> *"When there are more than four SVs under track, the weakest signals have very little impact on the user's navigation solution since the Kalman filter in the GPS receiver tends to emphasize the strongest and most stable signals and de-emphasize the weakest and least stable signals."*

This is not true. Given track, the availability of signals with large angular separations is a much more significant factor in determining navigation accuracy. Weak, low elevation signals often play a significant role in determining position.

6: L/Q et. al. make much of the possible improvements to GPS receivers described in the Johns Hopkins report of January 1999. Most of these are either multi-element phased array techniques or involve integration with an inertial navigation system. Either way we are talking several thousands of dollars and several pounds of weight to perform the modifications. We could argue that GMPCS handsets should be equipped with an 18" dish and a car battery and make just about as much sense. Also, what of the millions of incumbent GPS users and their equipment?

7: L/Q et. al. claims[7] that LSC's example safety of life applications make no technical sense. Maybe not to L/Q et. al., but these systems are fielded, saving lives, and working quite well.

In light of the above discussions, it is clear that L/Q et. al. doesn't know what they are talking about with regards to GPS. LSC and the U.S. GPS Industry Council have provided the FCC with expert comments and engineering data to alert them to the broader

---

[4] L/Q et. al. at section 2.1 of their technical appendix.
[5] L/Q et. al. at section 2.1 of their technical appendix.
[6] Eg. L/Q et. al. at section 2.4 of their technical appendix.

[7] L/Q et. al. at section 2.4 of their technical appendix.

implications of their decision regarding GMPCS out of band emission limits. If we have been remiss in not commenting sooner, that is unfortunate but it does not alter the conclusion:

FCC Proposed GMPCS out of band emission limits are insufficient to protect existing GPS safety of life applications from potentially life threatening interference.

Respectfully submitted,

LSC, Inc.

By:_____

Logan Scott, Principal
P.O.Box 4734
Breckenridge, CO 80424

loganscott@compuserve.com
http://ourworld.compuserve.com/homepages/loganscott/LSChome.htm

Dated: July 31, 1999