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Re: WT 06-49: the *LMS-M ITS Radio Service* NPRM.

The following supplements the preceding, 2010 and 2011 filings in this docket by the entities listed above (herein, "SkyTel"). Herein, we further present progress in two matters.

1. C-HALO and M-LMS. We previously reported in this docket on the cost-benefit study of Cooperative High Accuracy Location ("C-HALO") by the Institute of Transportation Studies at the University of California, Berkeley since it will show the great need and promise of C-HALO using M-LMS as a primary spectrum source.¹ Our companies, captioned above (via our common operations support entity, ATLAS Wireless LLC) in large part initiated and funded the study, but it is conducted solely by this Institute's researchers' objective work in the public interest.²

¹ See <http://its.berkeley.edu/>.

² Adam Goodliss, Venkatesan Ekambaram, Dr. Christian Manasseh, Dr. Raja Sengupta, Dr. Adib Kanafani, and Dr. Kannan Ramachandran, "Cooperative High-Accuracy-Location (Next-Generation US Positioning Infrastructure)" ("HALO" or "C-HALO") commenced in 1Q 2010, and enabled by a charitable donation from SkyTel's joint-operations company, ATLAS Wireless. See "Acknowledgment" in the attached status report. Interim report at: <http://www.its.berkeley.edu/publications/UCB/2010/WP/UCB-ITS-WP-2010-1.pdf>.

The benefits side of the study has been concluded, and demonstrated benefits higher than we previously noted in this docket. From *\$160 to \$320 billion a year* for core ITS benefits, mostly safety, and not considering other ITS and a host of non-ITS benefits (which, according to other C-HALO studies and papers from other parts of the world, indicate may exceed these core-ITS benefits).

The cost side is being further checked against figures from some State governments and other sources (involved in C-HALO based on statewide or regional Network RTK deployments, and in addition, the study is being sent to outside experts in related fields for comment prior to finalization. Our companies do not control this process, but have regularly contributed suggestions and means to the University research team to facilitate sound and expeditious completion. When the study is complete, we will present it in full in this docket, including how M-LMS can be used to support C-HALO in various forms commencing with near-term ITS application and carrying through to, or close to, “automated highways” (which is the “higher-end” of ITS concepts and goals).

The technology is available for achieving this as we previously summarized. We continue daily in research and means to achieve this.³ Implementation will need to be in stages. M-LMS can provide the core spectrum, in accord with the FCC’s goals and current rules for this ITS radio service. Others may implement C-HALO to some degree, including on commercial wireless, but it will take major, dedicated spectrum capacity, and like GPS, the core system and services should be open and at no cost for wide adoption and functions required for successful ITS and other critical services.

2. LMS and Meteor Burst Communications (“MBC”) for ITS and synergistic uses, including emergency wireless in regularly occurring emergencies, and upcoming extraordinarily severe wide-scale disasters by extreme solar flares.

We previously described in this docket MBC for ITS, used along with M-LMS. We described the nationwide 43 and 35 MHz spectrum our companies obtained in FCC Auction 87 for this purpose. We supplement that topic here by the attachments. In sum, as the experts in these attachments describe, MBC is especially suitable for very wide-area, cost-effective, lower-data rate secure communications which are critical for many wide-scale ITS applications. MBC to fixed remote and relay sites can be extended by use of M-LMS 900 MHz radios along roadways and other areas. This is reflected in the attached. For example, in Attachment 5, for the National Research Council, MBC and LMS are the two wireless services described specifically for ITS. In one configuration, LMS (M- and N- LMS) can provide ITS-dedicated coverage and capacity along roadway lengths, especially in higher traffic areas, and MBC can provide nationwide coverage and deliver various ITS

³ In our January 21, 2011 report in this docket, we footnoted that the following as one of the step we are taking to most fully and securely use M-LMS for these ITS- C-HALO purposes:

Several years ago, Telesaurus Holdings GB LLC irrevocably assigned, by disaggregation, 2 MHz out of the 6 MHz (bandwidth) in all its M-LMS licenses to Skybridge Spectrum Foundation as an outright charitable gift. This year, Telesaurus is arranging to make a certain “Phase 1 Use” irrevocable outright charitable-gift assignment to Skybridge of the remaining 4 MHz.

We have presented orally and in writing this Phase 1 Use plan to FCC staff. They are in the process of responding with advice as to how this may be accommodated within FCC rules and procedures, or under waivers if needed, but they have not yet completed their review and response to the undersigned. The main issue involves a LLC Series’ control of assets (in this case, FCC licenses), up to a defined degree (defined wireless capacity in defined geography), that would be donated to Skybridge, but where said Series’ assets are under the ultimate control of the LLC. This and related issues do not appear directly addressed in FCC rules and precedent.

updates to the roadway stations relaying that to the vehicle on LMS. (Other configurations are also possible.)

In addition, as papers we post and annotate at the below Scribd link show, MBC can provide, in addition to cost-effective nationwide broadcast and two-way communications: positioning sub-nanosecond time transfer and synchronization, and unique encryption and authentication (of the MBC and any other wireless link. These are all independent of GPS and other systems, creating great value in these MBC services, in as much as jamming or failure of GPS positioning and timing (and related security enablement) would cause failure or major degradation of the nation's critical infrastructure and public safety systems, including communications and transportation. While most aspects of MBC are well known and established, these, just noted, are not: they are however described in technical papers with some examples of implementation (many from Russia, and some from the US). We are having these reviewed by MBC, wireless, and PNT (position, navigation, and timing) experts. Thus far, the science checks out. We intend to make the results public, in accord with our overall approach to public interest wireless.

We also describe here, by the attachments, the unique great value of MBC—by itself and with M-LMS— for emergency wireless—including so that transportation of goods and services can continue in disasters, including during and after extreme solar flares that, according to NASA (see Attachment 1) will likely cause major disruptions to the nation—some times far worse and more extensive than an event such as Hurricane Katrina.

As NASA notes in Attachment 1 hereto, these extreme solar flares have occurred and will continue to occur one or more times a century. They have not yet had a serious affect as they will have from now on, since during past extreme solar flare events the nation (and the “developed” world) had not been operating, as we now are, based upon critical systems using electric and electronic components that can be “fried” by extreme solar flares—including (non-MBC) communications and GPS systems. It will potentially take months, and for some operating-level restoration years, to restore critical systems after an extreme solar flare event, according to the experts. The greater effects on society, the economy, and defense do not appear to even be well considered (at least not easily found publicly, were the discussion needs to be for a remedy).

The science is clear on this. The science was also clear as to the near certainty of recurring Hurricanes of the size of Kartina to hit the US, but that knowledge was not acted upon, and it cost far more to attempt a fix after than it would have before. *Similarly, the nation IS NOT preparing seriously for the far greater disruptions that extreme solar flares are likely to cause in the foreseeable future: The first line of defense and recovery in this form of disaster (and others) is to have in place a backup communication systems that will survive such an event and operate well afterward:* Meteor Burst Communications will do this better and far more cost effectively (for the basic forms of communications to critical services) than terrestrial or satellite wireless (which can be fully or seriously “fried” by extreme solar flares) or other forms of sky-wave wireless. This has been recognized often by the US military and other experts, as shown in Attachment 1 below and other MBC papers we post and annotate at the first link below, in the MBC folder..

As noted previously, all major aspects of our MBC (and broader, MBC / M-LMS /200 MHz, etc.) plans are public, reflected in large part in the following links:

www.scribd.com/warren_havens/shelf

www.docstoc.com/profile/warrenhavens01

Respectfully,



Warren Havens

President

Skybridge Spectrum Foundation (M-LMS licensee)

Telesaurus Holdings GB LLC (M-LMS licensee)

And associated LLCs indicated above⁴

Attachments

⁴ Skybridge Spectrum Foundation is an IRS-recognized tax-exempt 501(c)(3) organization. These other LLCs hold FCC licenses in lower 200 MHz and MAS 900 MHz. All of the captioned LLCs are managed by Warren Havens, who is also Director (and trustee in the public interest) of Skybridge Spectrum Foundation. The Foundation (on a nonprofit basis) and these LLCs (on a combined profit and supportive charitable basis) have cooperative plans to use their respective FCC licenses for public-interest wireless, principally, “intelligent” or “smart” transportation, energy, and environment radio systems nationwide. No financial or economic benefits flow from Skybridge to said LLCs or to any private party: all Skybridge assets and actions, under expert nonprofit legal counsel guidance, are in support of government purposes and other IRS-approved public-benefit publicly disclosed purposes. In part for these reasons, Skybridge reveals publicly its plans far more extensively than if it were a private for-profit entity. All the Sky-Tel entities also do that in this and other presentations in this docket in attempt to mitigate the risks and damages caused by the subject NPRM.

Attachments list

All attachments may be found online by Googling or in the Meteor Burst Communications (“MBC”) Folder at www.scribd.com/warren_havens/shelf. Most attachments are excerpts from original papers.

Notes:

- The Text boxes added to some pages of below original documents are by W. Havens for above-signed entities: these notes were added for placing the documents online on Scribd but are useful for this Docket 06-49 presentation also.
- As some of these added notes explain, all of these documents’ descriptions of MBC were of the simple prevailing form, using one or a few narrowband channels and one or a handful of master stations. Our companies plan to use many wider channels and substantial numbers of master stations which will increase by some order of magnitude the overall performance, redundancy and resilience, etc.
- In the attachments, “SkyTel” means Skybridge Spectrum Foundation and the supporting LLCs listed above.

#	Page	Item
1	1	Re: <u>MBC</u> as best communications during and after disruptions by extreme solar flares. Re-presenting <i>several NASA online articles, 2001 and 2009</i> , and attaching a US Navy Postgraduate Thesis, Mark A Gates, “ Survivability of Meteor Burst Communications Under Adverse Operating Conditions ,” 1992.
The following are in one physical attachment.		
2	1	Re: <u>MBC and 900 MHz</u> for secure cost-effective monitoring. M.A. Ewanic, et. al, MSE Technology, “ Development of a Remote Monitoring System Using Meteor Burst Technology ,” 2006
3	7	Re: <u>MBC network, equipment, pictures of US DOA “SNOTEL.”</u> US DOA, NRCS, Snow Survey Centennial, “ SNOTEL Electronics History ,” 2006
4	11	Re: <u>MBC in detailed report on communications for ITS.</u> Lockheed Martin, for US DOT, FHWA, “ ITS Communications Document ,” 1997.
5	31	Re: <u>MBC and M-LMS in detailed report on communications for ITS.</u> Kimley-Horn, for the Transportation Research Board, National Research Council, “ Communication Mediums for ITS, Final Report ,” 1996
6	43	Re: <u>MBC for Emergency Communications in US.</u> US DOC, NTIA, “ Meteor Burst Communications Compatibility ,” 1989
7	48	Re: <u>Spectrum use and Cognitive Radio in VHF including best MBC range (30-50 MHz)</u> Steven W. Ellingson, Virginia Polytechnic Institute, “ Spectral Occupancy at VHF: Implications for ... Cognitive Radios ,” 2005