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November 18, 2005

Via E-Mail and Messenger

The Honorable Kevin J. Martin
Chairman
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Spectrum Needs of Emergence Response Providers
Intelligence Reform and Terrorism Prevention Act of 2004
WT Docket No. 05-157; FCC 05-80

Dear Chairman Martin:

The record-breaking hurricanes that wreaked catastrophic damage this fall on the Gulf coast states reaffirmed the continuing inability of first responders and other public safety officials to communicate during and following natural disasters. Space Data Corporation ("Space Data") strongly supports your recent testimony before Congress that emphasized first responders' ability to rely upon a rapidly deployed, interoperable and resilient wireless system that allows different organizations from different jurisdictions to communicate with each other.

As the Commission prepares its report on the spectrum needs of emergency response providers and the state of public safety services to Congress as required under the Intelligence Reform and Terrorism Prevention Act of 2004,[1] Space Data wishes to bring to the Commission's attention its system's ability to solve two primary communications problems present during any disaster – range of communication and interoperability of equipment. Space Data can offer responders a simple, cost-effective solution that can augment existing terrestrial infrastructure and that can be quickly deployed when and where it is needed. No new equipment is required for users on the ground – they keep the same radios that they have always used – but those radios would be significantly more effective. In fact, with the Space Data network first responders can extend their communications range by a factor of ten and can communicate with other public safety providers using different equipment on difference radio frequencies.

[1] Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. No. 108-458, 118 Stat. 3638 (2004).

This letter describes Space Data, its network, and the commercial, military and public safety applications of its network. As the Commission assesses how to promote more effective emergency communications in the United States, it should look to new and innovative commercial wireless technologies such as those deployed by Space Data's *SkySite* Platform. Space Data also requests that as part of its assessment, the Commission ensures that its rules do not unintentionally preclude Space Data and other innovative commercial companies from helping first responders dramatically improve the efficiency and effectiveness of their systems, because they cannot get timely access to radio frequencies.[2]

I. BACKGROUND

Space Data was founded eight years ago with a simple idea – to provide wireless communications services to consumers, public safety and military personnel by flying payloads between 65,000 and 100,000 feet using weather balloons. Space Data's solution builds upon 60 years of successful weather balloon launches by the National Weather Service to deploy a highly reliable wireless network using the latest technology. Today Space Data has a commercial data network operating over Texas, Oklahoma and neighboring states and it is moving into mobile voice and broadband offerings. A map depicting Space Data's network is set forth in Figure 1 below.[3]

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[2] More than 97 MHz of spectrum is allocated in support of public safety communications, including 24 MHz in the 700 MHz band, 50 MHz at 4940-4990 MHz and several other spectrum bands.

[3] Space Data is licensed to provide narrowband personal communications service ("PCS") services throughout the United States. Space Data also was the first company to commit to provide wireless service to tribal nations with limited telecommunications through the Commission's tribal land bidding credit program. The Commission has authorized Space Data to operate its balloon-borne devices as terrestrial base stations. *See Petition for a Declaratory Ruling, a Clarification or, in the Alternative, a Waiver of Certain Narrowband Personal Communications Services (PCS) Rules as they Apply to a High-Altitude Balloon-Based Communications System*, 16 FCC Rcd 16421 (WTB 2001).

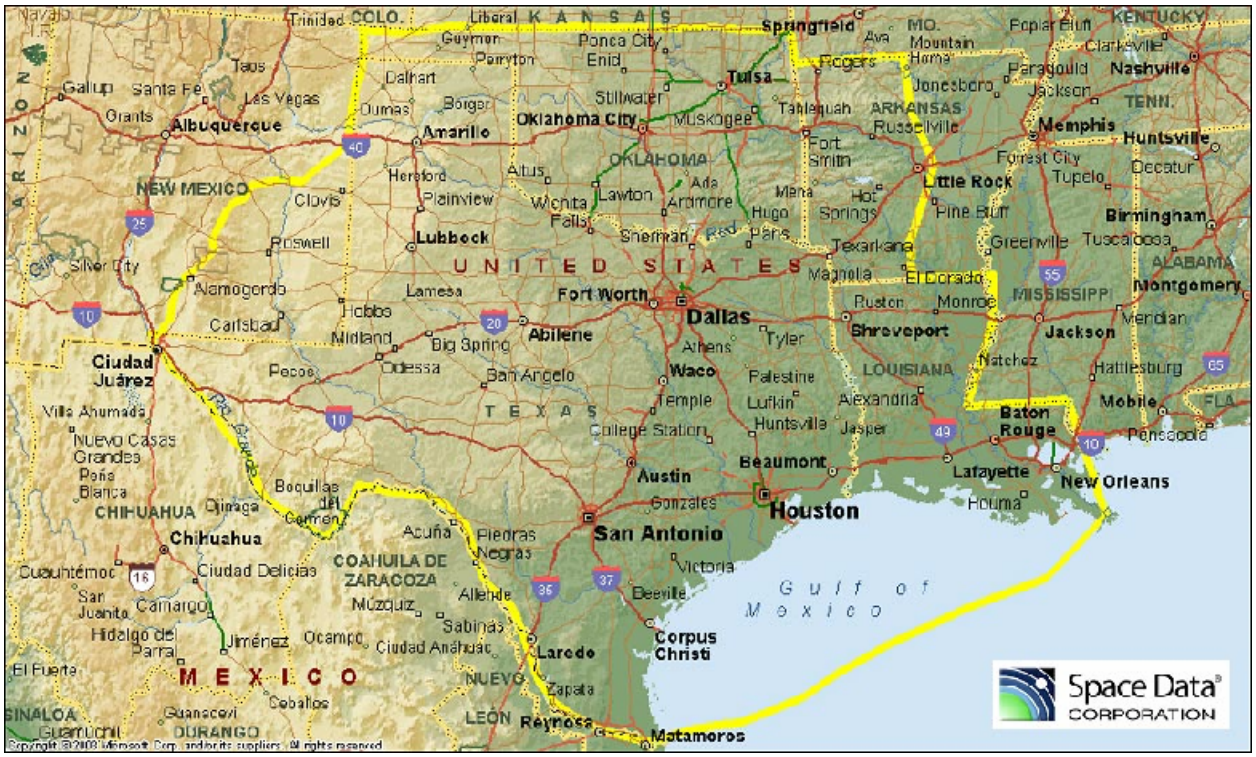


Figure 1. Current Coverage of Space Data's Commercial Network

Space Data has developed special radio platforms, called *SkySite*® Platforms, by which its network operates. Each *SkySite* Platform provides the functionality of a standard wireless base station that is located on the ground, but weighs less than six pounds and is lofted by a balloon to an altitude over 65,000 feet effectively creating an antenna over 10 miles high. As shown in Figure 2 below, one person can launch a *SkySite* Platform, which provides 12 to 24 hours of coverage before being parachuted safely back to earth and recovered. To date Space Data has completed over 5000 *SkySite* Platform flights as part of our commercial operations.[4]

[4] Further information regarding the operations and engineering parameters of Space Data's network is available in the construction showing for one of Space Data's narrowband PCS licenses. *See* ULS File No. 0001900882 (filed Oct. 13, 2004 and granted Jan. 13, 2005).

Figure 2. Launch of a Space Data SkySite Platform

Several articles and materials providing further information about Space Data's operations and network also are attached.

II. WORK WITH THE US AIR FORCE

Over the last couple of years Air Force Space Command has become interested in what it calls "Near Space" – the area of the atmosphere between 65,000 and 325,000 feet. This altitude is too high for most aircraft and too low for satellites, but ideal for Space Data's *SkySite* Platforms. The Air Force Space Battlelab recently selected Space Data as the cornerstone of its near-space initiative named Combat SkySat. Space Data's flight of a radio platform at 70,000 feet was an eye-opening experience for the military participants. Suddenly, as depicted in Figure 3 below, a handheld radio carried by the average ground troop, which typically has a normal range of only five to ten miles, transmitted digital, secure, voice communications between two soldiers located more than 400 miles apart.

Figure 3. Results from Combat SkySat testing with the US Air Force

After that success, Space Command decided to sponsor Space Data's participation in the 2006 Joint Expeditionary Force Experiment ("JEFX"). JEFX is a biennial exercise that showcases new technologies for the Air Force and the Army. Space Data's participation in the next JEFX event will allow it to demonstrate how *SkySite* Platform technology gives individual soldiers the ability to communicate with existing equipment but at over ten times their normal range.

III. SUPPORT FOR DOMESTIC OPERATIONS

The inability to communicate while on the battlefield in an Iraqi desert is a soldier's worst nightmare. First responders echoed the sentiment after Hurricane Katrina. They had no way to call for medical assistance, no way to call the police or fire department, and no way to communicate among themselves. Terrestrial networks do not usually survive major disasters intact – either their base stations are destroyed or power/backhaul outages render them useless. Space Data's network, however, provides a solution to this inevitability.

Space Data's *SkySite* Platforms can be launched from well outside the affected disaster area and do not rely on backhaul facilities within the disaster area. In fact, since *SkySite*

Platforms fly much higher than storms and fires, they can provide communications during the disaster itself. Immediately afterward, they can provide wide-area communications so that the radios carried by police, fire, medical and National Guard personnel can reach across the entire affected area. Not only does this give first responders the ability to be more effective in rescue operations, it can provide that link through radio equipment they already own and use every day.

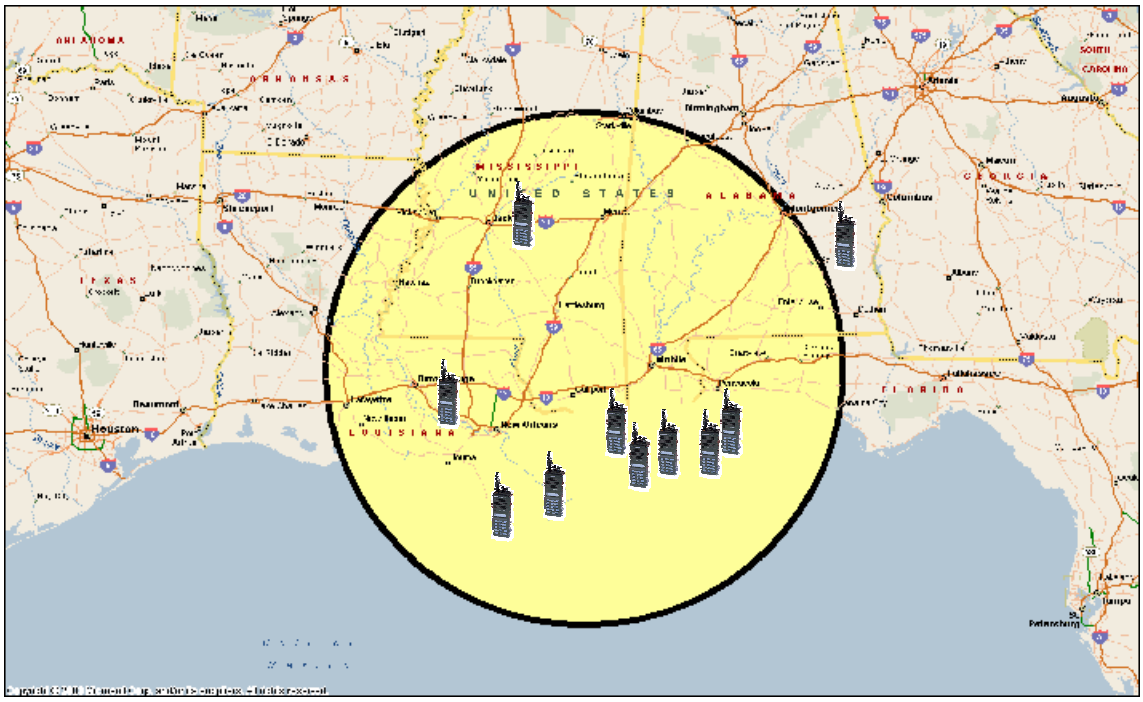


Figure 4. Potential coverage of a single SkySite Repeater along the Gulf Coast

Space Data's *SkySite* system can be held in reserve, then deployed on short notice to provide communications over the affected area. For example, a fire department could easily break out this equipment and launch a *SkySite* Platform when it gets called to fight a forest fire in a remote area. Similarly, National Guard units could use the system when they respond to requests for assistance, no matter where those deployments may take them.

As all units in the wide footprint communicate directly with one *SkySite* Platform, it is simple to enable group calling – allowing a hundred or more units to share one channel. This one-to-many mode of communication is especially effective in coordinating a group of individuals working to accomplish a mission over a wide area. Capacity of a *SkySite* system depends on the same parameters as any wireless system – the spectrum available, the spectral

efficiency of the technology deployed, the frequency reuse, the size of a cell, and the capacity required by each user. Each *SkySite* Platform can service one large footprint, or spot beams can be used to break the footprint into smaller cells.

The *SkySite* system is inherently flexible. It can expand to meet additional needs as required by simply deploying more *SkySite* Platforms. If the area of operations shifts, then the communications network can shift with it. When the emergency is over or when terrestrial networks are restored, the *SkySite* network can be stored until the next time it is needed.

IV. "BRIDGING" NETWORKS

There is another urgent and compelling problem that Space Data's *SkySite* Platforms can resolve – ensuring the interoperability of incompatible radio networks. A conventional radio repeater re-broadcasts transmissions on a single network, allowing police officers to talk with other police officers, firemen to talk to other firemen, National Guardsmen to talk to other Guardsmen. These groups, however, are unable to talk and coordinate relief efforts with each other during a disaster because their radio equipment is not compatible. A paramedic and a National Guardsman could be 100 yards away from each other, yet unable to communicate.

A second type of *SkySite* payload, called a bridging repeater, carries two or more radio transceivers to "bridge" radio communications networks. With this payload launched, different groups on the ground could tune to one of their existing radio channels and have their communications re-broadcast on the other network. This would allow police to talk to firefighters, and the FBI or National Guard to talk to local law enforcement. Again, the system could be kept in reserve until needed, deployed, and then stored until the next emergency. This bridging repeater concept was also demonstrated to the United States Air Force as part of the Combat SkySat Program mentioned above. This bridging capability allowed troops on the ground using handheld tactical radios to communicate directly with pilots in A-10 and F-16 aircraft using standard military aeronautical band radios. These real-world tests demonstrated how a Space Data *SkySite* repeater could bridge an FM terrestrial network to an airborne AM network, allowing personnel to use their standard equipment.

V. COST

Space Data's *SkySite* system, consisting of inexpensive weather balloons and radio repeaters, is a cost-effective means to provide effective wireless communications during a disaster. The radio repeaters can be fitted with GPS tracking and can be recovered and reused multiple times. As noted above, one *SkySite* Platform can cover hundreds of miles and is easily deployed. Moreover, emergency responders will no longer be required to build and maintain expensive terrestrial systems. Rather, *SkySite* Platforms can be deployed before, during, and after a disaster and then stored until the next emergency.

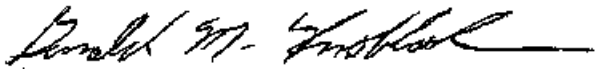
VI. CONCLUSION

Government agencies at the federal, state, and local level must have the best tools available to respond to crises such as the recent hurricanes or other disasters. Space Data offers a solution that can augment existing terrestrial infrastructure for wireless communications, filling in coverage gaps created by a storm's destruction. Space Data's solution would enable communications before, during and after major events, and can be deployed rapidly and be operational while repairs to terrestrial networks are ongoing.

The Commission should evaluate technologies such as Space Data's *SkySite* Platforms before the next emergency or natural disaster occurs and should consider ways in which this kind of technology can ensure that an effective communications system is in place when the time to respond is at hand. As part of this evaluation, the Commission should analyze how the *Skysite* platforms can access public safety frequencies, perhaps using a streamlined procedure, to help improve first responder capabilities.

The U.S. government should be prepared before the next disaster or other emergency so that effective communications systems are immediately put in place. As was evident after Hurricane Katrina, lives can be lost if there is no immediate way to communicate and respond. The United States has seen again and again that reliable, effective communications can mean the difference between life and death during a disaster. Future national emergencies or natural disasters are inevitable, and it is essential that the government at all levels plan better and more creatively for our first responders the next time.

Very truly yours,



Gerald M. Knoblach
Chairman and Chief Executive Officer
Space Data Corporation

Attachments

cc: Commissioner Kathleen Q. Abernathy
Commissioner Michael J. Copps
Commissioner Jonathan S. Adelstein
Catherine W. Seidel
Cathleen Massey
David Siehl