

111th SPACE OPERATIONS SQUADRON



MISSION

111th Space Operations Squadron works with Air Force Space Command to operate balloons in near space to assist ground to ground communications.

LINEAGE

111th Space Operations Squadron

STATIONS

Sky Harbor International Airport, AZ

ASSIGNMENTS

WEAPON SYSTEMS

Combat SkySat Balloon

COMMANDERS

HONORS

Service Streamers

Campaign Streamers

Armed Forces Expeditionary Streamers

Decorations

EMBLEM

MOTTO

NICKNAME

OPERATIONS

Balloons as communications tools? Of course, says Chandler, Ariz.-based Space Data Corp. In late August, the Arizona National Guard's 111th Space Operations Squadron and staff from developer Space Data demonstrated Combat SkySat, a balloon-borne communications system.

Following the trials-Space Data won a \$1.4 million contract to participate in the upcoming Joint Expeditionary Force Experiment, which the military uses to assess new battlefield innovations. The event takes place under the auspices of the Air Force Joint Chief of Staff and combines live flight, ground and naval forces to simulate a war-fighting environment.

The helium-filled balloons serve as floating towers, carrying radio equipment to an area called "near space," which is the space between 12 miles and 62 miles above sea level, above where airplanes fly, but below where satellites are stationed. From the ground, they can't be seen, except during launches and retrievals.

Once the 6-foot-wide balloons are in place, they expand traditional line-of-sight radio communications from about 10 miles to more than 400 miles of coverage.

And this wildly expanded coverage costs \$5,000 to \$25,000 per off-the-shelf balloon. Col. Patrick Rhodes of the Air Force Space Battlelab at Schriever Air Force Base in Colorado said the cost could get even cheaper, down to between \$1,000 and \$5,000, if the military enters into a mass production scenario.

Battery power for the balloon's radio system lasts about 10 hours, at which point the balloons can either parachute back to the ground and be located via global positioning system technology or they can be programmed to self-destruct, whichever is most palatable for the mission at hand. Once retrieved, balloons can be loaded with fresh battery power and can be re-launched.

The balloons already are in use by oil and gas companies in Texas, Oklahoma and New Mexico. Col. Rhodes said the Air Force is looking into how the technology could be used in tactical situations, such as close-air support, convoys and special operations missions. Col. Rhodes also said that other branches of the military are briefed on the progress of balloon technology during quarterly meetings where technology gurus from all branches of the military gather to share information about new and emerging technologies.

Space Data said the Arizona branch of the Department of Homeland Security is interested in how the balloon technology could apply to border patrol communications in the southwestern United States, a region where coverage is sparse, as are funds for improvements.

And in the wake of massive communications failures in the Gulf Coast region during and after Hurricane Katrina, imagine the possibilities of balloon technology. Both Col. Rhodes and Space Data executives said their people are in talks with the DHS.

"It's ironic, because the day after the hurricane hit, we held a graduation ceremony for the 111th, who had just gone through our training program, and all we could talk about was how useful this would have been for the people in the Gulf Coast area," said Mark Davis, director of marketing at Space Data. "We immediately started making lots of phone calls, and we've gotten

expressions of sincere interest. We're confident that we'll be well positioned to help keep communications flowing the next time a major hurricane comes through."

Davis went on to explain that severe weather doesn't necessarily interfere with the balloon's ability to provide communications because the balloons are stationed in near space, which is far enough above Earth to avoid the pitfalls of weather interference. Though it probably would not be possible to launch the balloons during a storm, they can be launched either before the inclement weather begins, or away from the inclement weather, up to 350 miles away from their ground stations, equipped with high-gain antennas.

For the military, the company is providing a turnkey system, including the network equipment and training. For other commercial clients, Space Data runs a network based on the client's needs.

The engineering team at Space Data still is hard at work developing the next phase of balloon technology.

"The balloons can be an overlay system for wireless networks," said Jerry Quenneville, vice president of engineering at Space Data. "About 20 percent of the population doesn't have access to digital voice communications because the carriers don't have a cost-effective way of providing coverage to rural areas. Imagine what would happen if there was a cost-effective way to provide coverage. For one thing, the carriers would have a significant boost in their earnings."

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Sources

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