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Blimps To Provide Expanded Communications For Marines In Iraq

By Geoff Fein

Marines in Iraq will soon be getting blimps to improve non-line of sight communications among ground units and between ground units and aircraft, according to a Defense Advanced Research Projects Agency (DARPA) official.

The Marine Airborne Re-Transmission Systems (MARTS) was developed by DARPA to fill a Marine Corps urgent need statement for non-line of sight communications, said Larry Stotts, deputy director of the advanced technology office.

"Right now you have to put [a] tower on the ground and those require protection," Stotts said. "[The Marines Corps] asked us to look at airborne assets."

DARPA created a relay capability on the blimp to take the Marines' UHF and VHF radios along with the Single Channel Ground and Airborne Radio System (SINCGARS) and the Enhanced Position Locating and Reporting System (EPLRS) as well as their normal analog radios, he said.

"All the radios they are using in Iraq, we provide the way to pick up that signal," Stotts said.

The first blimp is being deployed to Iraq, however its exact location and delivery date are classified. The Marine Corps is procuring a second blimp right now, Stotts said. And the service is trying to get money for four other blimps they need, he added.

Each blimp, including the ground station, cost \$3.5 million, Stotts said.

"The ground station is probably the most expensive part, around \$2.5 million," he added.

Communications equipment onboard MARTS can cover a range of 125 kilometers, Stotts said. "The idea is that at any point within the operational area you have a high probability of being within line of sight [of] one of these."

"We did communications between a C-130 and [MARTS]. We showed we could do it over [a range of] 100 miles," Stotts said. "[MARTS] was at 3,000 feet and the plane was at 9,000 [feet]."

The relay radios are contained in the ground station, that way should the blimp be damaged or drift off the radios won't be lost. The communication equipment on the blimp is positioned on the underbelly and there is both a transmitter antenna and receiving antenna on either end of the blimp, Stotts said.

There were some interference challenges with the antennas early on, Stotts explained.

"These antennas sometimes leak into each other. Because we have such weak signals from handheld [radios] there is some leakage into the receiver antenna which caused us not to hear those [radios]," he said. "We had to work on radio frequency interference."

Solving the problem took a few days of analysis. "It was more cleverness than technology," Stotts said.

The ground station system takes the electrical signals from radios and converts them into light and sends it up a fiber optic line embedded inside a thick tethering cable to MARTS. The light is then converted to electricity and run through a transmitter that recreates the signal, Stotts said.

Fiber optic cable was chosen to avoid electro magnetic interference issues, he added.

Another advantage to keeping the radio gear on the ground is that should any component break, technicians wouldn't have to bring the blimp down for repairs, Stotts said.

A blimp can run for two weeks before it would need refueling, and can remain afloat in winds up to 50 mph, Stotts said. "Higher than that you have to bring it down and tie it down."

The Marine Corps is looking at putting surveillance equipment on future generations of the blimp, Stotts said. It would be just a matter of adding another box to include infrared radar, he added.

The Army has also expressed interest in the blimp, but they want an airship, something they can move around, Stotts said.

"We chose this because the Marine Corps didn't have a lot of money. Affordability was a key driver for the Marine Corps. This was the lowest cost option," he said.

Once in Iraq, the blimps will be flown at altitudes of 3,000 feet at strategic locations so that Marines can have seamless connectivity across their operational area, Stotts said.

Although it will be easy to spot MARTS from the ground, Stotts said the ruggedness of the blimp could handle small arms fire.

The blimp can even function with a 4-inch diameter hole in its material.

"It's easy to patch, even though it is exotic material," he said.

The blimp, made by **TCOM LP** in Columbia, Md., uses a combination of Kevlar, Mylar and other proprietary materials for the outer skin, Stotts said.

TCOM also makes blimps that are being used along the U.S. southern border and in Florida, Stotts said. The company has also sold its blimps to Kuwait and Saudi Arabia, he added.

TCOM wasn't the first choice to build the system, according to Stotts. In fact, the program was supposed to be wrapped up last July. But when DARPA began testing the first blimp there were a number of problems with it, Stotts said.

"When we went to demonstrate it at Yuma [Proving Ground], Ariz., last summer, it turned out the material had some problems. The aerostat was leaking gas quite significantly and when we went to Yuma [it only stayed up] six hours," he said. "It wasn't robust enough to send to Iraq. We redid program in August with TCOM."

Although TCOM's system is more expensive, Stotts said, "it worked like a champ" during testing at Elizabeth City, N.C.

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