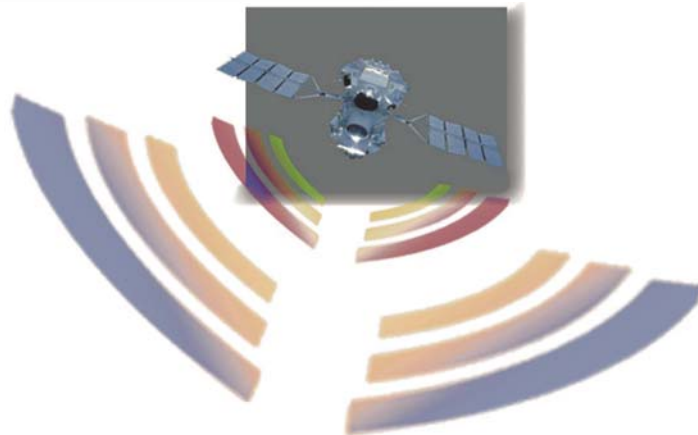




Monitoring Movement in Real Time with Space-Based Blue Force Tracking

The ability to determine the precise location and status of military units, vehicles, aircraft, and individual soldiers gives allied commanders an extraordinary advantage.



During the 1995 U.N. peacekeeping operations in Bosnia, the dramatic helicopter rescue of a U.S. Air Force F-16 pilot, trapped four days behind enemy lines, focused attention on an unresolved challenge of modern warfare: how to track the movement of “allied” soldiers in the field to improve operations and, more importantly, save lives.

Senior U.S. military officials wondered if advances in satellite technology had finally brought this challenge within reach. Could the technology behind the sophisticated Global Positioning System available to today’s car buyers—technology developed from World War II radar—be used to monitor movement on the battlefield in real time?

Some seven years later, military leaders can now send troops into combat with the knowledge that they’ll be safer. This is due to the development and implementation of a remarkable new architecture that utilizes the speed and precision of space-based systems to accurately monitor and report troop positions and movements back to a command and control headquarters—all in real time.

Called Space-Based Blue Force Tracking, this concept leverages existing satellite technology by supporting the collection and dissemination of timely friendly-force position reporting. The ability to determine the precise location and status of military units, vehicles, aircraft, and individual soldiers gives allied commanders an extraordinary advantage in the battlefield, from the ability to carefully direct its firepower and minimize friendly or innocent casualties, to tracking and rescuing downed air crews and wounded soldiers within minutes. And it gives commanders a range of other advantages, from maintaining a situational awareness of current battlefield conditions to better organizing clandestine special operations.



Working together
(left to right):
Kim Miller and
Dave Hendrickson
of Booz Allen, Lt.
Col. Timothy Sutlief
(U.S. Army),
Maj. Mike Sulek
(U.S. Air Force),
Booz Allen's
Mike McCoy,
Adam Velie, and
Sandra Richard.

Almost as impressive as the technology itself was the process developed by the U.S. Space Command/Booz Allen Hamilton team in bringing it to the battlefield. Although the use of Space-Based Blue Force Tracking had been discussed in one form or another for years, there was never consensus until recently on how various military stakeholders could effectively integrate the applications for this emerging technology into a key capability for joint military operations.

High Visibility, High Value

"The Booz Allen team took Blue Force Tracking from a vision of the future to making it happen," said Lieutenant Colonel Timothy Sutlief, chief of the Space Exploitation and Integration Branch. "We went from merely toying with the idea to concept form and making it work in the battlefield. Space-Based Blue Force Tracking was tested and passed. It now has a high visibility across the Department of Defense."

Blue Force Tracking was to have received pilot testing in the fall of 2001, but was rushed into extensive use to support allied operations in Afghanistan, simultaneously raising its profile and demonstrating its value. By early October—three months ahead of schedule—it was operating 24 hours a day, with Booz Allen consultants joining their military counterparts in manning shifts.

Lieutenant General Tom Goslin, the former commander of the Space Warfare Center (now Deputy Commander of U.S. Strategic Command), credits Blue Force Tracking with being "a critical element in the conduct of field operations" in Afghanistan during Operation Enduring Freedom.

For Booz Allen Senior Vice President Glen Bruels, "This is the kind of assignment we look for at Booz Allen: the opportunity to demonstrate high impact for a critical and previously unaddressed challenge."



"The benefit isn't just an immediate operational capability," added Bruels, the project's officer-in-charge, "but a well-defined architecture and program that is battle-tested and has the potential to save lives."

At the heart of Space-Based Blue Force Tracking is an approach that essentially links or piggybacks the Blue Force mission to the payloads of existing satellites. Coupled with technical architecture that the team rescaled from a handful of ground-based users, this pragmatic concept can now be used by thousands in the field. The development of Space-Based Blue Force Tracking is the first major example of the U.S. Space Command delivering on its mission of providing combat-relevant capabilities to combat forces in the field.

"Booz Allen helped make it happen," said Lieutenant General Goslin of this successful first use of Blue Force Tracking. No wonder senior military comman-

ders now rank Blue Force Tracking among the three most important new capabilities available to allied forces in Afghanistan. And no wonder the U.S. Strategic Command team continues to develop the technology's operational doctrines in the hope of exploiting this technology further.

"Client's Mission Ours"

"Given the current explosion of interest among commanders for the need for Blue Force Tracking, it's ironic to think that just a few years ago when this program was on the drawing board, nobody seemed to want it," said Booz Allen Senior Associate Bobby Goodman. "But our task was to work on the architecture and to bring people on board. Our client's mission became ours; it's something we believed in strongly."

Getting those stakeholders on board was the daunting challenge faced back in 1995 by the U.S. Space Command, as

**“Our client’s mission became ours;
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the organization chosen to link space system technologies with the needs of military and national security operations worldwide. With Booz Allen, the Space Command needed not only to design an integrated architectural framework responsive to warfighter operational needs, but to get disparate military constituencies to accept the new system, and to secure adequate funding for the program.

But regional warfighting commanders-in-chief, the National Reconnaissance Office, and the Space Command came on board when they recognized how an integrated series of space-based capabilities could translate to real-world battlefield operations. A critical follow-up step was securing funding for the program from the U.S. Department of Defense, which was reassured in September 2000 when General Hugh Shelton, then Chairman of the Joint Chiefs of Staff, approved the \$3.3 million request to implement a Space-Based Blue Force Tracking center.

Booz Allen Program Manager Cathy Breeze says the key in getting those stakeholders to support the project was in bridging techniques in traditional organizational change with rigorous engineering discipline.

“There were two elements we had to tackle—developing the architecture, and shaping the

thinking of the Department of Defense in helping them to see how beneficial Blue Force Tracking could be,” Breeze said. “It took a lot of thinking outside the usual boundaries of consulting to make it work—nuts and bolts engineering work and strategic planning. We needed to think about the immediate, and what Blue Force Tracking would look like in 20 years.”

Covered: Most Areas of the Military

To make it happen, the team turned to a multi-disciplined group of Booz Allen experts in the areas of defense, national security, and organization and management. The Booz Allen team included more than 15 engineers, software developers, operations analysts, and test and evaluation experts, whose combined expertise covered most areas of the U.S. military establishment.

That the program worked is testament to the considerable technical skills of the combined Space Command/Booz Allen team. Team members attribute their success to something more—“a true passion for what we were doing,” said Goodman. “In hindsight, this was a team—a mixed bag of skills—where everyone brought their perspectives and dynamics to make it a success. We were so focused and so committed that after a while, it didn’t even seem like work.”



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