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Technology for the Warfighter

BG Robert P. Lennox, Deputy Commanding General for Operations, United States Army Space & Missile Defense Command

New technology, joint forces advancing modern warfare

By BG Robert P. Lennox

Soldiers prepare by studying the art of war and training. Scientists and engineers prepare by thinking about, looking for, creating, and developing capabilities that will enhance the warfighters' effectiveness. Both often face difficulty in carrying out their charters. But the fact that neither gives up is what has made our Army the best, most advanced in the world.

I'd like to say that the SMDC Battle Lab - Space Directorate went from the learning of the requirement to the concept on the drawing board to the warfighter in the field in six weeks, but that's not exactly what happened. Two years ago, the Army Space Support Teams (ARSST) were requesting larger bandwidth so they could respond more quickly to requests for Space products and imagery (which are typically very large files and even larger when they are encrypted). As part of its experimentation plan in support of transformation, the Battle Lab had integrated a number of off-the-shelf communications products, encryption, computer systems, and some other items into the Space Support Element Toolset (SSET), a HMMV-mounted assemblage of "tools" with which the Space Support Team supported the commander and his staff. The Battle Lab tested their creation at Millennium Challenge 2002 in August 2002. It outperformed their expectations.

As the command was planning for Operation Iraqi Freedom, commanders knew that they wanted to send the ARSST forward with the best equipment. The Battle Lab responded by reengineering the SSET's capabilities into a smaller, transit case-sized version, procuring the various parts, assembling and testing twelve systems, and sending a mobile training and fielding team into theater with the Army Space Support Teams.

The new system, dubbed the SSET-Light, greatly enhanced the team's ability to provide accurate, timely, and effective Space products to the supported commanders. Besides offering the teams a suite of Space-specific software tools, the SSET-L made possible wideband communications connecting them not only to the HQ in Colorado Springs, but also to each other, Eagle Vision 1, an imagery ground station, and the Spectral Exploitation Cell - Transportable (SPEC-TR), in theater. With the SSET-L, teams could receive 2 megabytes of data per second and send up to 900 kilobytes per second. They routinely downloaded files of 100 megabytes and greater in minutes — and these were encrypted files. Previously, files of this magnitude would have taken hours to receive, if at all, or required FEDEX delivery. More importantly, the teams no longer needed to burden the supported unit's communications networks.

There is no doubt that the synergy created in this command by having the operational forces working hand-in-hand with the research and development people helps get operational needs filled quickly. Generally, that is how our military system works, i.e., the fighter has a need and combat developers work with research and developers and the fighter look for the solution through one of the DOTLMPF areas: doctrine, operations, training, leader development, materiel, personnel, and facilities.

Two years ago, SMDC produced a "Capabilities Catalogue" listing all the equipment and products along with their capabilities that had been developed by the SMDC Battle Lab, Technical Center, and the Army Space Program Office. From reading the descriptions of items, I could imagine that the people who worked in those organizations had either received a requirement that needed to be met or had seen a capability and knew that it had possible military application. It was also evident that they were already thinking about or making improvements to what was already in the field, e.g., the Grenadier BRAT (GB).

Almost forty years after the first V2 flew and when the nation still had no effective defense against a missile attack, President Ronald Reagan directed the Department of Defense to determine if it was technologically feasible to field a strategic defense to defend the nation against intercontinental ballistic missiles. Now, twenty years later, the Ground-based Midcourse Defense (GMD) system is advanced enough that President George W. Bush, has directed the system to go on line for initial defensive operations in October 2004.

Grenadier Beyond Line of Site Remote Asset Tracking (BRAT) and mini-transmitters (MTX) provide commanders with real-time updates, via Space-based systems, on the locations of their forces and other friendly forces. The GB weighs about 5 lbs and is best suited to permanent mounting on vehicles and aircraft. Its counterpart, the MTX, is about 2 lbs and is better suited to being carried by Soldiers. (The Grenadier BRAT and MTX are but two systems that the military has for tracking its forces.) The Army has now fielded more than 2500 of these devices that are enhancing the effectiveness and safety of its Soldiers.

According to the "Capabilities Catalogue," they could be upgraded with a target engagement capability that would allow forward-deployed Soldiers to report the coordinates of targets. In the two years since the publication of the catalogue, the Army Space Program Office has put the laser-rangefinder integration on prototypes and demonstrated them during a live-fire exercise (JCIET 2003) in August 2003. Soon they may be in the hands of our troops.

History is rich with stories of mankind finding new and better ways to do things. Englishman James Watt saw the possibilities and improved on Thomas Newcomen's steam engine that fired the Industrial Revolution. American Eli Whitney won the contract in 1798 to produce 10,000 muskets for the young American Army fearing a war with France. To do so quickly he put his idea of precision machinery manufacturing interchangeable parts to the test. He succeeded, produced the weapons, and his system of manufacturing soon became the standard practice for American business. (Fortunately, the war with the French did not occur at that time.) Starting in the Civil War, Thaddeus Lowe led the way by using the hot air balloon to gather intelligence on enemy troop movements. By the end of the century others were experimenting with cameras mounted on kites and on pigeons. Today we're using satellites and unmanned aerial vehicles and yes we are still using lighter than air ships ... the JLENS/RAID is deployed today in Afghanistan.

In the 1930s, German Werner Von Braun used the work of American Robert Goddard to develop the V2 rockets that terrorized London near the end of World War II. They came down from the stratosphere without warning, could not be spotted, nor shot down in flight; there was no defense against them.

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In mid-October, we activated the GMD brigade in Colorado Springs, Colo., and, in early December, we will activate the GMD battalion at Fort Greely, Alaska. Our missile crews and staff will be trained. And the technology, advanced through research and development, will provide them their initial set of missile interceptors.

Like a number of products I read about in the

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"Capabilities Catalogue," researchers and developers will continue to improve the GMD system. They will use the Alaskan base as a test bed for the interceptors. The integrated test bed will provide for more realistic tests and data that will be used for further system development and refinement. It will also expand to test weapons and sensors from throughout the entire integrated ballistic missile system, a system of layered defenses designed to protect the Nation and its allies.

History tells us that sometimes people do not see the advantages of new inventions, and we must beware of being too conservative or unimaginative. For example, early Gatling guns and machineguns faced Army conservative pressure, and the fear that too many rounds would be fired, creating logistics problems. Early repeating rifles were discouraged because the Soldier would fire his ammunition too quickly. As a result, in some clashes Soldiers with single-shot rifles faced Native Americans with repeating rifles. When Alexander Graham Bell tried to make the case for his telephone in London, he was informed that his "interesting" invention might have some limited use in America with its great distances, but in Great Britain their multitude of messenger boys would suffice. In the 1950's, a government panel of experts reported that the U.S. government would never need more than five computers. Just imagine where the military would be if someone hadn't seen the possibilities and pushed forward.

From a requirement to a solution, the military's combat developers, engineers, and researchers provide our military with equipment that makes Soldiers more effective. They help us stay ready for war so we can better achieve peace.