

Technology Insertion and Sustainment for Army Tactical Satellite Communications —Three Decades of Success

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In 1978, the Army awarded contracts for the first multichannel Tactical Satellite Communications Terminals (TACSATs) designed to provide critical reachback communications for deployed forces, allowing voice and data circuits to be extended from anywhere in the world using the Defense Satellite Communications System (DSCS). The DSCS consists of a constellation of geosynchronous satellites orbiting the Earth at 22,500 miles above the surface. These satellites act as transponders, in the simplest sense, reflecting signals from deployed forces back to a terrestrial access point. From 1978 to present day, the demand for satellite communications has expanded exponentially to the point where thousands of satellite terminals and dozens of constellations exist around the world.



The DSCS consists of a constellation of geosynchronous satellites, one of which is depicted here, orbiting the Earth at 22,500 miles above the surface. (Image courtesy of Lockheed Martin.)

The first large-scale, multichannel, high-data rate TACSATs procured by the Army were designated as the AN/TSC-93 and AN/TSC-85. Under the first production contract, these terminals were capable of providing circuit extension for voice and data communications. Since that time, these terminals have undergone four major upgrades designated as the A, B, C, and D models. These terminals are still used by the Army 31 years after they were procured, and they still provide the same mission-delivering, high-data rate critical communications for worldwide deployed forces.

Technology Insertion Versus Sustainment

The most recent upgrade to the AN/TSC-93 and AN/TSC-85 TACSATs was the D model upgrade. This was

accomplished through a partnership between Tobyhanna Army Depot (TYAD), Tobyhanna, PA, and the U.S. Army Communications-Electronics Command (CECOM) Life Cycle Management Command (LCMC), Fort Monmouth, NJ. The D model upgrade was accomplished via Modification Work Order, and was termed the TACSAT Service Life Extension Program (SLEP). Under the SLEP concept, these terminals were upgraded using

insertion of state-of-the-art technology. This “technology insertion” concept takes advantage of product developments in the private sector and allows the Army to benefit from investments made by commercial industry. Technology insertion saves the Army millions of dollars annually, since procuring new systems is usually more costly than upgrading older ones. The technology insertion process is also usually accomplished in a much shorter time frame than procurement of new systems, allowing the Army to field new technology to Soldiers faster.

Nearly everyone in the Army military and civilian world is familiar with the term “sustainment.” But what does sustainment really mean? In the traditional sense, sustainment of communications electronics systems includes repairing and refurbishing

existing electronics. However, sustainment also implies technology insertion. Communications-electronics technology is evolving at a rapid pace in today’s

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world, and sustaining older electronics becomes more costly every year. Cost/capability tradeoff analyses inevitably reveal that inserting new technology costs less than sustaining older technology. Not only does technology insertion reduce sustainment costs, but it also provides the Soldier with

enhanced capabilities not available from the older, legacy electronics. This process implies an upgrade, but in today’s technological world, there is a gray area between sustainment and upgrade.

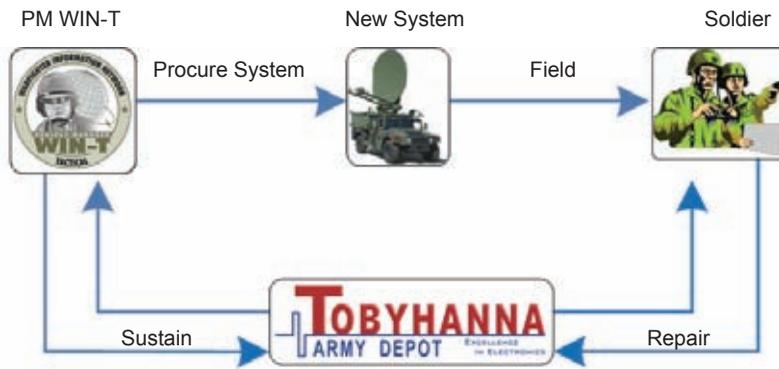
COTS Versus GOTS

The AN/TSC-93 and AN/TSC-85 TACSAT SLEP uses the commercial-off-the-shelf (COTS) and government-off-the-shelf (GOTS) approaches to provide for the sustainment and upgrade of these older legacy systems. The TACSAT SLEP upgraded 178 Army terminals to D models from 2004 to 2008, as well as 19 terminals for the U.S. Marine Corps, resulting in better reliability, upgraded capability, and lower sustainment costs.

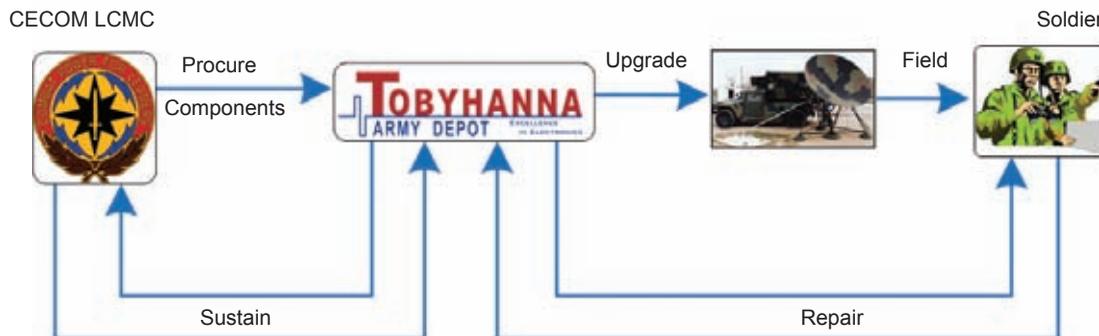
COTS implies electronic products that are currently available from the private sector and fully meet the Army’s requirements. GOTS refers to products that are readily available from government organizations such as the Army, and are COTS products that are usually modified by the government in some way. The term “modified COTS” means the same thing as GOTS in the TACSAT arena. Typically, the Army contracts a private manufacturer to modify its standard commercial product to meet specific requirements.



SSG Guy Fuhrman shows PFC Joshua Smith the operation of the orderwire in an AN/TSC-85D TACSAT at Camp Victory, Iraq. (Photo by Donald W. Mumma, CECOM Senior Command Representative, U.S. Army Sustainment Command Headquarters.)



Procurement of a new TACSAT



Upgrade of an existing TACSAT

These products are then purchased, stocked, and issued to the Soldier.

Procurement of New Systems Versus Upgrade of Existing Systems

The procurement of new TACSAT systems and the upgrade of existing TACSATs are held in balance by the Army. The older legacy terminals

continue to be upgraded and sustained, and the fielding of new systems is always on the horizon. For example, the AN/TSC-93 and AN/TSC-85 terminals were upgraded to a D model during the same time frame that the Program Manager Warfighter Information Network-Tactical (PM WIN-T) procured the new AN/TSC-156 Phoenix TACSAT. Both of these programs serve the Army equally well, ensuring that our Soldiers have the newest, most capable technology needed to win the information war.

undergo more upgrades, and new high-capacity communications capability systems are in procurement.

In summary, the Army’s balance between the upgrade of existing TACSATs and the procurement of new systems has been working well for our Soldiers for more than 3 decades. The Army is “keeping the TACSAT tradition alive” by diversification of satellite communications assets, therefore maintaining reliability, upgrading capability, and reducing sustainment costs for our Soldiers.



John Morelli, a lead electronics technician in the Satellite Communications Systems Directorate’s Engineering Design and Development Division, inspects a component of an AN/TSC-85C-Plus Enhanced Tactical Satellite Signal Processor prototype at TYAD. (Photo by Anthony J. Ricchiazzi.)

In 2009, the Army has authorized more upgrades of existing TACSATs as well as the procurement of new systems. The AN/TSC-93, AN/TSC-85, and AN/TSC-156 terminals have been authorized to

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