



Engineers in Task Force XXI

By Lieutenant Colonel Kevin Weddle, Lieutenant Colonel Cliff Farquhar, and Major Steve Gay

The 1st Brigade Combat Team, 4th Infantry Division, is conducting a predawn hasty attack on a dug-in enemy motorized rifle battalion. Late in the reconnaissance fight, the enemy commander unexpectedly changes his course of action. At 0200, with low illumination, the brigade commander decides on a high-risk, high-payoff night movement of the entire brigade to attack positions. He elects to move over some of the toughest terrain at the National Training Center (NTC). The attack kicks off at the right time, and the commander commands and controls the movement and attack despite total darkness and enemy-spoiling attacks. The brigade's main effort hits enemy defenses at the right location. Engineers breach multiple lanes in enemy complex obstacles in a matter of minutes. The mission is a success. On to the next challenge!

This scenario may sound like fiction, but in reality it was the next-to-last mission at the Task Force XXI Advanced Warfighting Experiment (AWE), which took place in March 1997. The night attack and its coordinated movements were made possible by the Appliqué system. The All-Source Analysis System and the Digital Topographic Support System (DTSS) provided terrain and enemy threat analyses, which allowed the main effort to hit the opposing force at its most vulnerable spot. The Grizzly (a visually modified M113)—along with some hard-working, well-trained, dismounted combat engineers—produced multiple breaches. This night attack illustrates the potential of the future digitized force. Engineers have been an integral part of this force from the beginning.

The Beginning

The Task Force XXI AWE process was an 18-month effort that will stand as the model for all future AWEs. It began in January 1995, when the Chief of Staff, United States Army, designated the 4th Infantry Division, Fort Hood, Texas, as the *Experimental Force* (EXFOR). The division designated the 1st Brigade Combat Team as *Task Force XXI*, which included the 299th Engineer Battalion. Early that spring, work began on a modified table of organization and equipment and task organization for a brigade combat team. An initial training plan was prepared with hundreds of milestones that would bring the brigade to the culmination of the AWE at the March 1997 NTC rotation. The brigade organization was finalized only weeks before our deployment to NTC. Brigade units included a light infantry task force, a mechanized infantry task force, an armored task force, an aviation task force, two field artillery battalions (direct and general support), an engineer battalion, a forward support battalion, an aviation support battalion, a brigade reconnaissance troop, and other combat support and combat service support units. The 4th Infantry Division Engineer Brigade, the 299th Engineer Battalion, and the U.S. Army Engineer Center began a parallel effort to develop tactics, techniques, and procedures for a digital engineer force.

The many engineer initiatives originally envisioned were pared to 12 systems or ideas tested by the 299th:

- Engineer organization
- Grizzly
- Appliqué

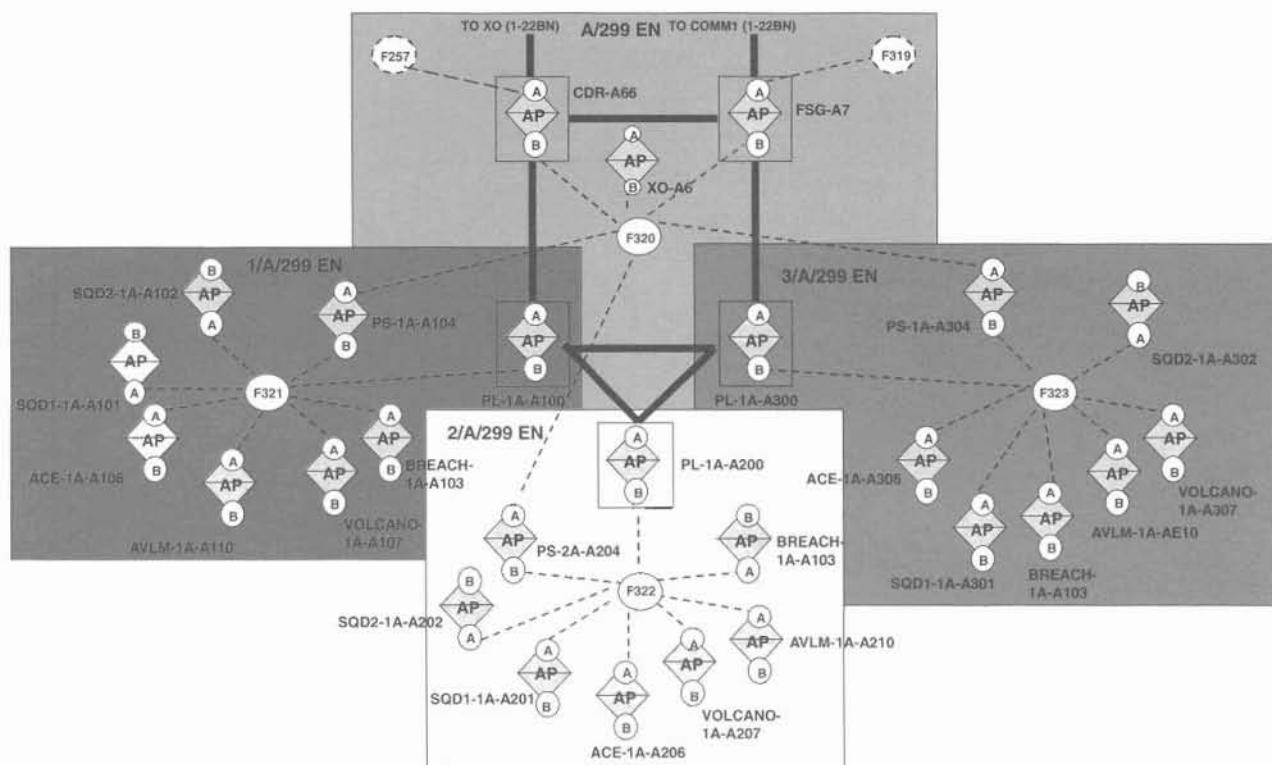


Figure 1. A Company, 299th Engineer Battalion, tactical internet

- Digital Topographic Support System
- Engineer Tactical Operations Center
- Maneuver Control System-Enhanced (MCS-E)
- Enhanced Position Locating and Recording System (EPLRS)
- Single-Channel, Ground-to-Air Radio System-Systems Improvement Program (SINCGARS-SIP)
- Battlefield Combat Identification System (BCIS)
- Hornet wide-area munitions

In addition to the new systems, the battalion also fielded the Volcano and 12 armored combat earthmovers (ACEs) to provide a permanent ACE/dozer mix of 12 and six, respectively.

Training

The training phase of the Task Force XXI AWE began in January 1996 with individual training for all brigade soldiers on the Appliqué, SINCGARS-SIP, and EPLRS systems. The brigade and the division set up a "digital university" (now called the *Computer Training Support Facility*), which was operated mainly by soldiers with significant support from contractors. The 40-hour courses operated 24 hours a day for a five-month period and reached virtually every soldier in the brigade. Concurrent with individual training, the brigade established an

installation yard where soldiers began to install Appliqué, SINCGARS-SIP, global positioning system (GPS) receivers, and EPLRS into thousands of the brigade's vehicles. Literally thousands of man-hours were expended in individual training and the installation process. Normal battalion business continued throughout the AWE process—including exercise evaluations, a Battle Command Training Program exercise, and fire fighting.

After the Appliqué system was installed and basic Appliqué training was provided to soldiers, the brigade combat team "plugged in" the system to see if it worked. Through a series of connectivity exercises conducted during the summer of 1996, the brigade tested the tactical internet to see if it operated as planned. The tactical internet was the communications and positioning network (using SINCGARS-SIP and EPLRS as the communications "pipes" over which the digital and voice traffic passed) that provided the brigade's situational awareness. Figure 1 shows one company's tactical internet architecture. The brigade's soldiers and contractors achieved higher than a 95-percent success rate for Appliqué-equipped vehicles. To achieve situational awareness without constant contractor assistance, the brigade established exacting tactics, techniques, and procedures (TTPs).

After the brigade was connected, we conducted collective training with the new organization. During this training, the brigade incorporated tactical and digital TTPs that were written and developed over the previous 18 months, trained on

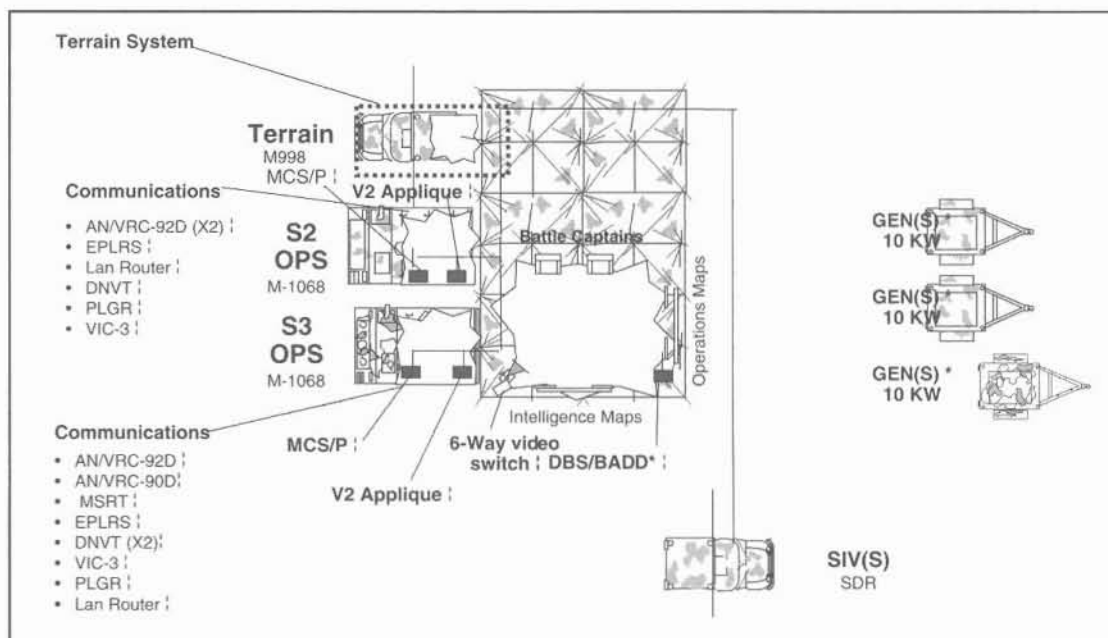


Figure 2. The 299th Engineer Battalion's tactical operations center

and evaluated more than 100 initiatives, and conducted normal NTC train-up missions.

Our rotation was unique in several ways. We deployed most of the brigade's vehicles, had many VIPs and press in attendance, and conducted no live-fire. We conducted several standard NTC movements to contact, hasty attacks, and defenses in sector during the first five days of the rotation. After that, the brigade moved into a continuous operations phase, where we operated continuously in both time and space. We received missions every day without the usual "prep day" and operated over the entire NTC maneuver area. During two defenses, the brigade defensive sector stretched from the northern to the southern boundaries of NTC. This action was an attempt to stress the tactical internet and to determine if the brigade was capable of increased tempo, lethality, and survivability through the magic of digitization. While the brigade did not win every battle, the beauty of almost perfect friendly situational awareness paid off time after time.

Lessons Learned

After returning to home station, we conducted a series of lessons-learned sessions and internal after-action reviews. Here are a few of the things we found:

Applique: The Applique system worked well for friendly situational awareness. We are not aware of a single instance where an Applique-equipped unit got lost, missed a movement or link-up, or experienced any of the other mishaps that occur when soldiers operate and train. Much of this system's success is attributed to the noncommissioned officers (NCOs), who helped develop the plan and kept it on track. Red (enemy) situational awareness was less user

friendly and less useful. The messaging component of the Applique system never worked very well. Overlays and long messages were too large to move digitally over the tactical internet, which was often clogged with messages. The tactical internet was too rigid and could not be tailored to changing task organizations. Positioning and digital message data moving over the Applique system often interfered with FM voices, degrading the range and quality. Fortunately, many of these problems have been solved or are being solved with the system that replaced Applique, the Force XXI Battle Command Brigade and Below System. Although its full fielding to the 4th Infantry Division has been delayed, limited user tests show great promise. The future tactical internet will have separate voice and data nets and will allow task organization changes "on the fly."

Hornet: The Hornet wide-area munitions have great potential for engineers. Throughout the AWE, the Hornet affected the enemy commander's psychology, provided early warning, reinforced conventional obstacles, disrupted enemy forces, and was a lethal killer. We found that all engineer and maneuver scouts can emplace Hornets in the counter-reconnaissance fight. The Raptor, which combines improved Hornets with sensors and communications gateways, was successfully tested in simulation during the Division AWE.

Digital Topographic Support System (DTSS): The HMMWV-mounted DTSS supported the entire brigade from the engineer battalion tactical operations center (Figure 2). This system was manned by soldiers from the 29th Engineer Battalion (Topo), Hawaii, who provided outstanding topographic support to every brigade unit. Since DTSS did not have full digital connection to units throughout the brigade, we hand-delivered hard copies of topographic



This Grizzly is ready to conduct a breach.

products. These products were better than anything the task force and team commanders had previously experienced. To better support brigade units, we developed a “push-pull” system of support. Units could always request specific topographic products from the engineer terrain team, which worked well when commanders knew what they needed. We also developed a standard package of topographic products for delivery to each unit depending on the mission. The combination of these two methods worked well. Brigade commanders probably became the most “topo-knowledgeable” commanders in the Army because of the direct and responsive support they received. Even without a digital connection, DTSS proved itself throughout the AWE process. Due largely to the success of DTSS at the task force and division AWEs, the Army has provided funds for full connectivity with other Army Battle Command Systems and to field the DTSS down to brigade level.

Revolutionary Warfare

Many have judged the Task Force XXI experiment based solely on the outcome of NTC rotation battles. Unfortunately, this misconception negates the almost unbelievable performance of the soldiers in the 1st Brigade Combat Team. The AWE was a two-year effort with unprecedented personnel tempo. The brigade fielded literally hundreds of new equipment items, wrote and tested TTPs for digital equipment no one had ever seen, sustained itself, trained hard, and changed schedules daily. Individual soldier sacrifices were immeasurable. With the possible exception of the airmobile experiments of the early 1960s, no peacetime Army unit has accomplished so much in so little time as Task Force XXI. The AWE process allowed accelerated procurement of key systems and development of

new and dynamic doctrine.

The AWE process is here to stay! If engineers are to remain an essential member of the combat arms, we must remain fully engaged. The 4th Infantry Division (EXFOR) continues to refine and improve the groundwork laid by Task Force XXI and the Division AWE. Thanks to the EXFOR, the Army will experience a revolution in warfare, not merely a predictable evolution in tactics.



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Lieutenant Colonel Farquhar was executive officer of the 299th Engineer Battalion during the AWE. He previously served as a staff officer for USFK in Korea; led platoons in the 237th Engineer Battalion in Germany; and commanded D Company, 15th Engineers at Fort Lewis, Washington. LTC Farquhar was killed in an accident in December 1998. He will be greatly missed by all who served with him.

Major Gay is an engineer staff officer on the Central Command staff. Previous assignments include S3, 299th Engineer Battalion; platoon leader and company executive officer, 326th Engineer Battalion (Assault); A Company and Headquarters Company commander, 65th Engineer Battalion (Light); and assistant division engineer, 4th Infantry Division (Mech). MAJ Gay served as the battalion's executive officer during the Division Advanced Warfighting Experiment.