Nett Warrior: Mission

U.S. Army

Seen by many as an essential facilitator at the tactical edge of Mission Command, the U.S. Army's Nett Warrior program highlights the importance of service organizational cooperation—as well as warfighter assessment and field experience—in refining and enhancing tactical capabilities.

As noted in ARMY Magazine's March 2012 "Soldier Armed," the program—named after Medal of Honor recipient COL Robert Nett—evolved through iterations of the Army's Network Integration Evaluations (NIE) with the expectation that it would likely continue to change the Nett Warrior design. A recent look at the system before NIE 13.2

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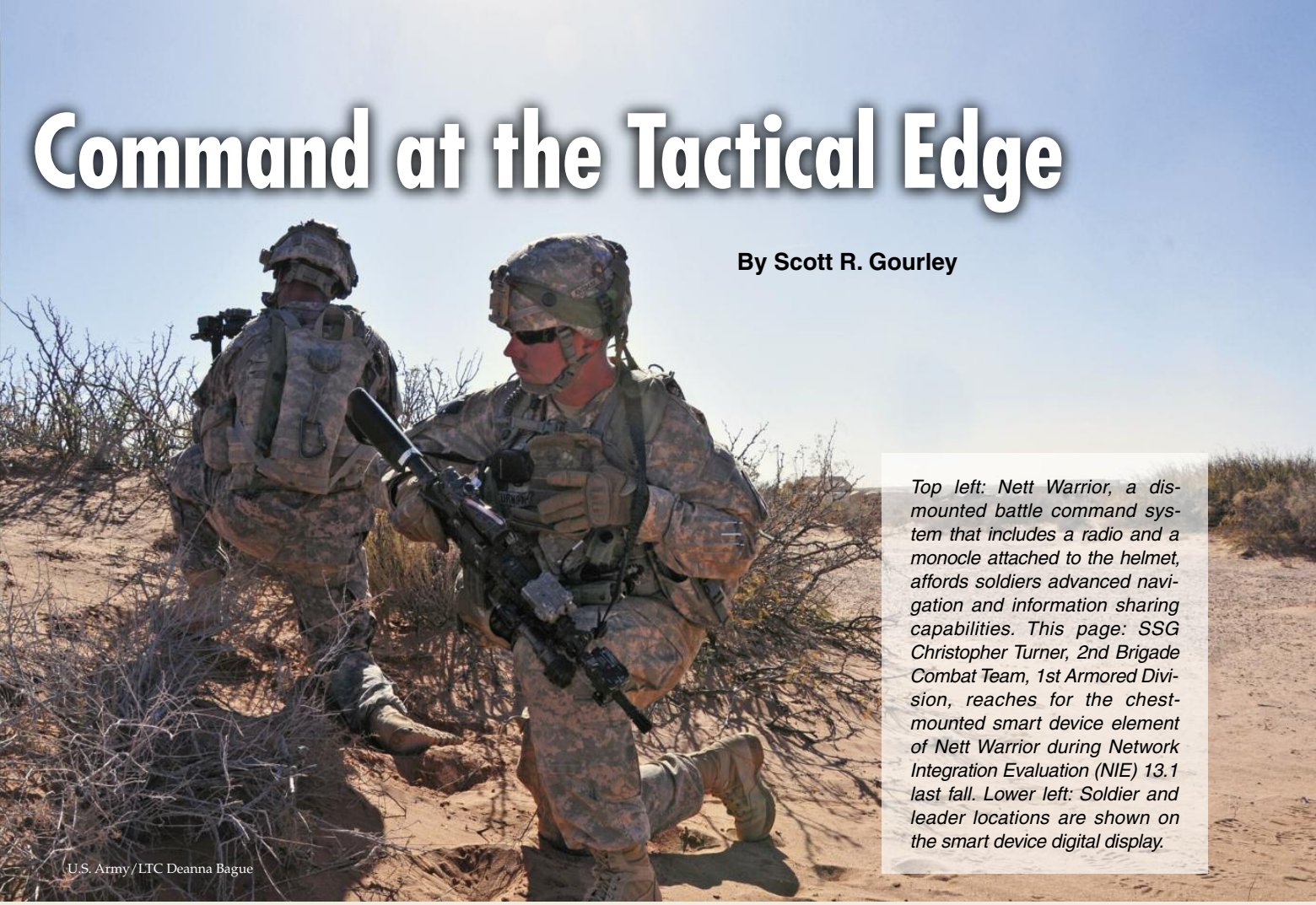
Command at the Tactical Edge

By Scott R. Gourley



U.S. Army/LTC Deanna Bague

Top left: Nett Warrior, a dismounted battle command system that includes a radio and a monocle attached to the helmet, affords soldiers advanced navigation and information sharing capabilities. This page: SSG Christopher Turner, 2nd Brigade Combat Team, 1st Armored Division, reaches for the chest-mounted smart device element of Nett Warrior during Network Integration Evaluation (NIE) 13.1 last fall. Lower left: Soldier and leader locations are shown on the smart device digital display.

(slated to begin in May) confirmed that assessment while emphasizing the dynamic impact of soldier input on today's programs.

Reviewing the evolution of Nett Warrior's predecessor, Land Warrior, by examining its Manchu, Strike and Centurion configurations, Mark Frye, team lead for the Project Executive Office Soldier's Product Manager Ground Soldier Nett Warrior team, said, "Each one of the designs had faster processors, more hard drive space, smaller components, less weight and more power. Nett Warrior started as a DOT&E [Director, Operational Test and Evaluation] overwatch program … so three vendors produced the original Nett Warriors." He acknowledged that the process had resulted in some new developments and relatively large components.

"Then the steering boards from DOT&E, the Assistant Secretary of the Army (Acquisition, Logistics and Technology) and the Chief of Staff's office all said, 'Stop.' They offered new guidance that moved this to a COTS [commercial off-the-shelf] program. They said they wanted us to buy off-the-shelf technology; it is lightweight and generally makes a better kit for the soldier," Frye said.

"The project manager was already leaning forward on future stuff," said Mark Davis, operations manager for the Nett Warrior team, "and that meant we were able to bring the COTS stuff in very quickly."

Frye explained that the very first Nett Warrior system to participate in an NIE, dubbed Nett Warrior Surrogate, basically involved "the old Strike system hooked to an SRW [Soldier Radio Waveform] radio—one of the very first [AN/PRC]-154s off the line. The whole purpose of that was to start working with the SRW wave."

Working with other entities, including the U.S. Army Signal Center of Excellence, the Nett Warrior team was able to bring the first Nett Warrior COTS device to NIE 11.2 (June–July 2011).

Frye recalled the software evolution through the early NIEs: "In 11.2, we came out with a Nett Warrior-driven software that was strictly an internal program. We had not reached out to the big C2 [command and control] community at that time. In the next NIE, 12.1, we reached out and we worked with JBCP [Joint Battle Command Platform]. JBCP picked up the software development with us as a backup, and they built the first JBCP-baseline software Nett Warrior.

"Every time we do this, the soldiers are giving us feedback and input," he added. "In 11.1, for example, they loved the GUI [graphical user interface] and its capabilities on the Nett Warrior side, but it was not interoperable with the vehicle platforms. That's why we went to JBCP. JBCP brought their software in, which was fully compatible with the vehicles, but the users hated the GUI. It was more engineer-driven and less soldier-driven."

Frye said continuing soldier feedback resulted in the building of a third software program "that was Nett War-

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Above: The Nett Warrior system displays maps, troop positions and operational updates previously restricted to vehicles of hard-wired command posts. Right: The Nett Warrior system includes a hands-free display, a small computer and networked radio transmitter/receiver.

rior GUI-based with JBCP capabilities. The baseline format was JBCP, but the 'top cover' that the soldiers saw was Nett Warrior." Soldiers got their first experience with that combination software during NIE 12.2 (May–June 2012).

"At NIE 13.1, the soldiers loved the GUI. They loved the fact that they were able to see the vehicles, so we are on target for where we need to be. Now it is just a matter of tweaking it for the soldier, and that's what we continue to do," Frye said.

Both NIE 13.1 and 13.2 are providing limited user test (LUT) venues for the evolving system. In addition to the software maturation, both COTS technical advances and NIE experiences have led to a number of recent hardware and power developments in the Nett Warrior design. With hardware, for example, the Nett Warrior configuration for NIE 13.1 integrated the mixed software with a Motorola Atrix phone end user device (EUD) connected to the AN/PRC-154 Rifleman Radio. It was also the first introduction of an "extended life package" featuring a SWIPES [Soldier Worn Integrated Power Equipment System] power pouch with external battery.

"The conformal battery feeds the cup, which keeps the radio charged," Frye said, "and it also feeds and charges the EUD. The conformal battery gives approximately 14 hours of power and, on top of that, you have another seven hours—give or take—in the radio."

Soldier feedback suggested the four-inch screen on the Atrix was small, so the 13.2 EUD configuration will feature the Samsung Note 1 with a 5.3-inch screen.

"The system is under test this time because of the human factors aspect of the Note 1," Frye said. "In addition to the larger screen, it also has better anti-glare features. The Atrix was pretty good, but it was a little smaller and had some glare issues. The soldiers said, 'Hey, daylight readability is not as good and here are some things we need you to fix.' It all reflects a continuous build on what soldiers want. They loved the extended life of up to 24 hours for one system. This was the 'hot spot' of the NIE for all positive critiques, so that was a 'sustain and make it better' effort as we continued to develop the system."

In addition to the larger EUD screen, another upgrade that is planned to go into the field at NIE 13.2 focuses on the map engine piece of the software.

"Because of the sizing capability of the SD [secure digital] cards, we couldn't give them all of the sub-meter high speed imagery they wanted," Frye said. "The time it took to get it onto an EUD was long and drawn out."

Another perceived system weakness stemmed from the fact that the cell phones were originally designed for civilian use.

"So when you do your 'pinching in' on a piece of map like Google Earth, and when you try to pinch past the best

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***Scott R. Gourley**, a freelance writer, is a contributing editor to ARMY.*

General Dynamics

The chest-worn Joint Tactical Radio System (JTRS), tested in NIE 13.1, was a Rifleman unclassified radio, above. The JTRS Handheld, Manpack, Small Form Fit (HMS) Rifleman radio, right, gives soldiers on the battlefield secure and mobile voice, video and data communications capabilities.

General Dynamics

[resolution] layer you can get and release, it will auto-focus back to give you proper pixelation," Frye said. "It gives you the pretty picture. That's how they're built, and that's how it was at the last NIE, but the soldiers were going in and pinching to get the icons to separate and get accountability of their people, and every time they released, the icons would pop back together."

In order to provide the tactical leaders with better command information, the new software package will speed up the process of loading imagery and compressing files to allow more information on the 32-gigabyte limit on the SD phone card where the imagery is stored. It will also allow users to pinch three layers beyond proper pixelation.

"He will get a little distortion on his image, but he can separate his space," Frye said. "With all of this, the soldiers tell us what they want. Our job is to capture those notes."

The 3rd and 4th Brigades of the 10th Mountain Division (Fort Drum, N.Y.) were recently fielded with the Atrix EUD design. The next fielded unit, 2nd Brigade Combat Team, 1st Armored Division, will be a directed requirement fielding in the July–August time frame and feature the Samsung Note 2 EUD.

"That will be a permanent fielded baseline for their unit that they will keep," Frye said. Given that the Note 2 systems were not available in time for inclusion in NIE 13.2, he added, "One of the biggest things the updated phone will provide is a faster processor—which is pretty fast anyway—but also a 64-gigabyte SD card, which means that the unit has a lot more space to put imagery. It will give them a lot more capability, and they won't have to be selective of their imagery baseline.

"There's another essential point here," he continued. "At a certain point, no matter what device we go with, big civilian corporations are going to stop producing it. Like the Note 1, there will be a time when we will not be able to purchase any more. We have to continuously upgrade to the next bigger and better thing that gives more bang for the buck to the soldier, while allowing us to go into new technology in the development of our program."

Another new hardware development being introduced for NIE 13.2 is the AN/PRC-154 "Alpha" leader's radio. Since earlier NIEs involved the AN/PRC-154 Rifleman—an SRW unclassified radio—Frye said, "In this NIE, we are testing not only the new EUD platform and upgraded software but also the leader's radio, which can go from unclassified up to secret. This will be the first time it has ever come into a network, so that will be another piece of our test."

One last hardware change involves the cabling between the EUD and the radio. Earlier "NW series" designs featuring black cables have been replaced by new "C series" green cables, which incorporate more durable connectors and reduce the chance of confusion when assembling. The latter modification stems from soldier comments and NIE lessons learned from an earlier design that permitted the possibility of connector pin damage. Redesigning the cables removed that possibility by physically eliminating any confusion in cable connections.

Frye emphasized that none of these changes occur in a vacuum. Rather, they reflect the ongoing coordination between the JBCP program, the Project Manager Tactical Radios, the Project Manager Soldier Warrior "Power Team," Product Manager Ground Soldier and other organizations.

"The best point to pull out of all of this is to think about how fast NIEs happen," Frye said. "Now, think about how fast these matching developments have happened. We take lessons learned daily from the NIEs and comments received from soldiers, and they are being acted on."