

YourArmy

# Touch-screen tacticians

## Tablets, cellphone advances put more power in soldiers' hands

By Lance M. Bacon  
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FORT BENNING, Ga. — Forty-six technologies turned out for the rigorous three-week Army Expeditionary Warrior Experiment, held here Oct. 17 to Nov. 3. Among them was a tag team of technologies that promises to make the Army squad the most lethal fighting force the world has ever known.

Leading the charge was a new

and improved Nett Warrior. Gone is the helmet-mounted computer screen some leaders had dubbed the "Col. Klink eyepiece." The system is now centered on smart-phone technology — and the soldiers here loved it.

Platoon leaders used tablets to conduct mission planning, monitor the mission and view aerial and ground sensor feeds. When a Desert Hawk III spotted an enemy

ambush team during a night attack, the platoon leader identified the location with the touch of his finger. Members of a squad immediately received the alert on their cellphones and adjusted accordingly. Within moments, the predator had become the prey.

Soldiers also used the phones to send and receive intelligence, communicate with commanders, and monitor blue and red forces. Using

the apps was as easy as playing "Angry Birds." With the touch of an icon, a soldier could call in an artillery barrage, for example.

Providing networked visual and voice data is critical to the squad of tomorrow. Brigades will push capabilities and responsibilities down the chain as the battlefield becomes decentralized. Soldiers must be trained, equipped and trusted to operate autonomously.

But providing that network isn't easy.

Most places to which soldiers deploy don't have the cell network you've come to know and love. Cellular technology has infrastructure to include towers, fiber optics and microwave channels. If that is absent, it must be created.

Current 3G base stations perched on high towers weigh as much as 300 pounds and blast 20 watts of power. This is not a feasible solution in the tactical environment. Even if combatants had access to such a station, a 3G network does not have the data capacity, or bandwidth, needed to provide the mission command data, voice and streaming imagery from aerial and ground sensors needed by squads and platoons.

Northrop Grumman answered that challenge with High-data-rate, Extended-range, Cellular and Mesh Network, or HERCM. This revolutionary 4G WiMax system is expeditionary in size and scope. It weighs 18 pounds and transmits at 200 milliwatts. The system creates a cellular node that provides about two miles of 4G coverage in an austere environment, said Maj. Philippe Persaud, of the Signal Center's Battle Command Battle Lab based at Fort Gordon, Ga.

The system converges disparate data streams into a single network, then onto a single device. It

also provides "back haul" to servers so data can be projected to soldiers at tactical edge.

While expeditionary in size and scope, it requires the right platform to work well. Essentially, it must loiter over the desired coverage area.

The system can be placed in an unmanned aerial vehicle. But engineers decided to put HERCM on the Combat SkySat balloon. The solution had its advantages and disadvantages. For example, the temperature quickly dropped

from 90 degrees to 60 degrees Fahrenheit one night. The gases contracted and the balloon dropped, causing soldiers on mission to lose coverage.

The frustrated war fighters quickly switched to FM to complete the mission.

The lack of a self-leveling platform also caused problems. When the system was not level, some directional antennas would point into the horizon, and no one on that side of the balloon would have coverage.

"Everyone has earned their balloon badge," Persaud said with a smile. "A lot has been learned about the physics of balloon flight and its use in communications."

The team also learned that soldiers need a stronger cellphone antenna because the smaller HERCM puts out less power, and the phone requires more signal power since the HERCM's antennas are far shorter than the 6-foot variants on a normal base station.

While HERCM had its issues at AEWE — Persaud described it as "building an airplane in flight" — the lessons learned and goals achieved have opened new possibilities that will forever change the battlefield of tomorrow.



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Spc. Jesse Williams of A Company, 1st Battalion, 29th Infantry Regiment, gives flight information to Sgt. Michael Dunn, from 1st Squadron, 1st Cavalry Regiment, 2nd Brigade, 1st Armored Division during the Army Expeditionary Warrior Experiment

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"We were very close on this," he said. "Very close."

**Getting that 'extra edge'**

Nett Warrior and HERCM were only two of 46 technologies featured at AEWE.

The live, prototype experimentation gives industry the opportunity to put its latest and greatest gear in the hands of combat veterans, who employ that gear in a wide variety of combat scenarios.

Everything from robotics to infrared lasers to unmanned aerial systems was brought to this latest AEWE iteration, called "Spiral G." It was not a test, assessment or training period. There was no "pass" or "fail."

But the data collected will have a lasting impact on combat operations.

The Experimentation Force, or ExFor, is composed of 61 soldiers from Alpha Company, 1st Battalion, 29th Infantry Regiment. They squared off against an Opposing Force, or OpFor, trained to employ emerging tactics and strategies.

Most of the dozen missions occurred at night in complex terrain. Each mission will have its share of unexpected problems and unmatched success.

And that is why AEWE has more than doubled in scope in seven years.

"We see our industry partners getting the soldiers' input very early on in the process and across the spectrum, and it has a huge impact," said Maj. Gen. Robert Brown, commanding general of the Maneuver Center of Excellence and Fort Benning. "We are seeing that the equipment we are testing that has the soldiers' input makes more sense and can possibly meet our future requirements. The Army Expeditionary Warrior Experiment provides a venue for some of that vital dialogue to occur."

The soldiers know what their brothers in arms need on the battlefield. They aren't impressed with flash; they are looking for function. And they have no problem telling industry when it misses that mark.

Conversely, industry welcomes the feedback. Chad Rickabaugh of DRS Technologies said the insight provided is "priceless."

"It helps us build a better product, and it ensures soldiers get everything they need," he said.

That mutual respect was evident at the end of each mission. When a piece of gear met the need, a smile and hearty handshake was shared. When it fell short, both sides came together to fix the problem.

Such was the case when a Desert Hawk III hit a strong tailwind while landing. The operator flared

the bird, but was too late. He clipped a tree. The crash banged up the nose and broke one wing in a 90-degree angle. A Lockheed Martin representative was on hand as the soldier broke out his repair kit: a screwdriver and a roll of duct tape. The rep showed the operator

how to reset the wing. They gave the bird a quick facelift while another soldier switched out cameras. The UAS was back on station in fewer than 10 minutes.

Everything that happens here affects the tip of the spear. What the Network Integration Evalua-

tion is for the battalion, brigade and division, AEWE is for the company, platoon and squad. These soldiers and the AEWE staff will help develop tactics, techniques and procedures for gear that is later incorporated.

"There is a lot of stuff here that I

wish I had when I was in theater," said Sgt. 1st Class Jon Duncan, platoon sergeant for 1st Platoon. "There's also some stuff that needs some work. But that's why we are out here. To make sure these soldiers will have the extra edge the next time they go into combat." □

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# High gear

Soldiers rated these new pieces — and found a lot to like

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Army Times asked soldiers from Alpha Company, 1st Battalion, 29th Infantry Regiment, to evaluate the gear tested during the Army Expeditionary Warrior Experiment in Fort Benning, Ga.

Soldiers rated the gear on a five-star scale, with five stars as the top rating. None of the items got a one-star rating. Here's the gear, and what soldiers said about it:

## THE RATINGS

- 5 stars = Get it in the field now!
- 4 stars = Would take it on mission
- 3 stars = Good idea, but needs work
- 2 stars = Not worth the effort
- One star = Waste of time

## 4 STARS

### Virtual Interactive Presence and Augmented Reality (VIPAAR)

VIP is a video-conferencing system that lets soldiers "reach" into the screen and to point out things such as the latest intel, or direct a change to mission.

The system already is a big hit in battlefield medical care. The battalion tactical assault command liked the company coordination that VIP provided. It also got thumbs up by being the only system that identified the five different UAV video feeds commanders were watching. This helped them better understand what they were looking at and how it played out in the big picture.



▲ A VIP composite screen with a hand virtually overlaid on a map scene.

### Long-sleeve T-shirt (Potomac Field Gear)

This moisture-wicking, fire-retardant shirt was a big hit for soldiers who wanted

something between a T-shirt and snuffle gear. The shirt is not bulky and it's breathable enough to prevent overheating, yet warm enough to keep the chill away.

## 5 STARS

### ACH Beanie (Potomac Field Gear)

One of the most popular items was also one of the smallest and cheapest.

The advanced combat helmet beanie is made with a soft microfiber that keeps sweat out of your eyes without causing your head to overheat. And it stops that uncomfortable "ring around the head" caused by most ACH liners. A cold-weather version also proved promising, though temps never quite dropped to a level that warranted its wear.

Teaming with the beanie is the ACH Impact liner (Revision). Soldiers liked the dual-foam padding, and found it much easier to catch a catnap when leaned against a Humvee door. Better still, the sweat-wicking material is designed to better absorb impact when hit.



▲ ACH Beanie from Potomac Field Gear

### Rover 5 (L-3 Communications)

Rover 5, mounted in mine-resistant all-terrain vehicles and the battalion TAC, allowed platoon leaders to easily switch between ISR intelligence-surveillance-reconnaissance feeds with no jump time and sharp clarity. It also has a "John Madden feature" that lets soldiers identify targets with a stylus.

Soldiers liked the size — Rover 5 is 5.5 inches wide and 3.5 pounds. They also liked its ability to transmit and receive on Ku-band, C-band,

S-band, L-band and UHF (400-470MHz). Video feed is analog, H.261, MPEG and MJPEG.

### Nett Warrior

Some soldiers were hesitant, having used the failed Land Warrior system. But their concerns were soon set aside.

Nett Warrior brought situational awareness into the 21st century. It featured the Motorola Atrix smartphone and Samsung Galaxy Tablet. Platoon leaders used it for



▲ The Galaxy Tab from Samsung will bring 4G capability to the battlefield.

mission planning and text communication with dismounted troops. Squads monitored Nett Warrior to track blue forces, obtain the latest intel and plot battlefield data.

Young soldiers had no problem learning the system, though some older warriors had to refer to the manual on more than one occasion.

### Desert Hawk III (Lockheed Martin)

The 6-pound, hand launched, unmanned aerial system was the one piece of gear the opposing force hated the most.

At one point, the "bad guys" used thermal blankets to hide their position from the 360-degree infrared turret, to no avail. The UAS essentially is inaudible, but its presence was known when soldiers effectively surrounded and pounced.

The ground station and remote video terminal



▲ Lightweight Data Tablet

### Lightweight Data Tablet (L-Tab) (L-3 Communications)

Soldiers, especially the precision targeting team, liked the larger screen on this rugged data tablet. Video was clear and sunlight-readable. Similarly, soldiers found the Lightweight Data Terminal 2 (LDT2) to be durable and dependable.

### UGV fuel cell & SC3500 radio for TALON

These upgrades give the multifaceted TALON robot a lot more range.

The fuel cell is so quiet, you can't hear it run. And it goes for eight hours on two small propane tanks — the kind that can be bought anywhere in the world. This huge improvement is diminished only by the lack of a "low fuel" indicator.

The radio acts as a relay, which enables this once line-of-sight robot to traverse natural and man-made obstacles at distances beyond 500 meters.

### Soldier ISR Receiver (L-3 Communications)

The receiver is able to display secure digital and analog ISR feeds into a small monocular or the Lightweight Data Tablet, enabling soldiers to see just about any intel picture or video out there.

The receiver saw heavy use in defensive positions, where unmanned aerial vehicles were able to provide soldiers a "bird's eye view" of the perimeter. Soldiers also liked the fact that it is durable and light, coming in at under one pound.

### Silver Fox (BAE Systems)

The OpFor could hear the gas/electric engine when this UAS circled overhead, but that was its only drawback. Its gimbal-operated, electro-optical and infrared sensors provided autonomous aerial surveillance and full-motion imagery in day and night operations.

At 30 pounds, this was the biggest fixed-wing UAS out there. But it proved dependable and durable. It boasted upwards of 10 hours of flight and is capable of autonomous takeoffs and landings.