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## Modern warfare meets actual warfare

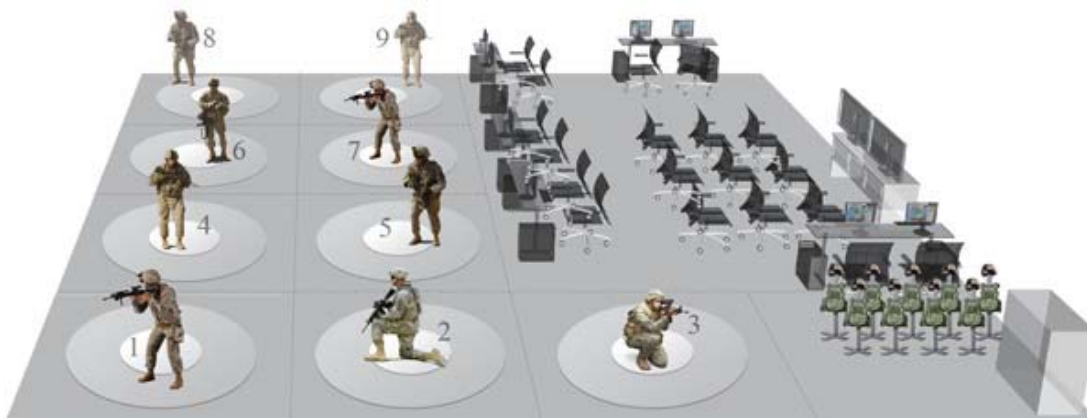
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By Dan Tynan, ITworld

The Duke of Wellington once said the battle of Waterloo was won on the playing fields of Eton. In the future, battles may be won on the playing fields of the Xbox and PlayStation, or something much like them.

At sites like Fort Benning, Georgia, Fort Bragg, North Carolina, and Fort Campbell, Kentucky, US Army personnel are training for overseas deployment using simulated 3D environments designed to replicate what they'll encounter in Iraq or Afghanistan. They're sweeping out buildings, ducking enemy fire, and disabling improvised explosive devices (IEDs) without ever leaving a 10-by-10-foot space in the middle of an otherwise empty building.



Dismounted Soldier Training System (DSTS), [Intelligent Decisions](#)

The [Dismounted Soldier Training System](#) (DSTS) uses PCs, modern gaming engines, and virtual reality gear to simulate actual battlefield conditions, says Floyd West, director of simulation and training for [Intelligent Decisions](#), which won the contract to build these units for the Army. The military recently deployed six of these systems to US bases, with another 30 set to ship out worldwide by the end of the year.

Every DSTS kit consists of 9 manned modules, each one featuring an immersive head-mounted display with microphone and speakers, a backpack CPU weighing between 12 and 15 pounds, a vest with embedded motion and pressure sensors, and a simulated weapon. There are also seven laptop workstations that allow

military trainers to control the action, introduce new elements into the environment, and review how each soldier did after an exercise is completed.

Inside the DSTS, soldiers stand on a three-by-three-foot pad and move their avatars across a battlefield hundreds of meters in size using toggle switches on their simulated weapons. When a grunt ducks or hits the floor, so does his avatar, says West. Soldiers can see and communicate with nearby squad members. If a soldier gets hit by enemy fire, his display flashes red and his movement is impaired by the system. If he's shot in the arm or the leg, his avatar can't run or use that limb.

#### Dismounted Soldier Training System Video

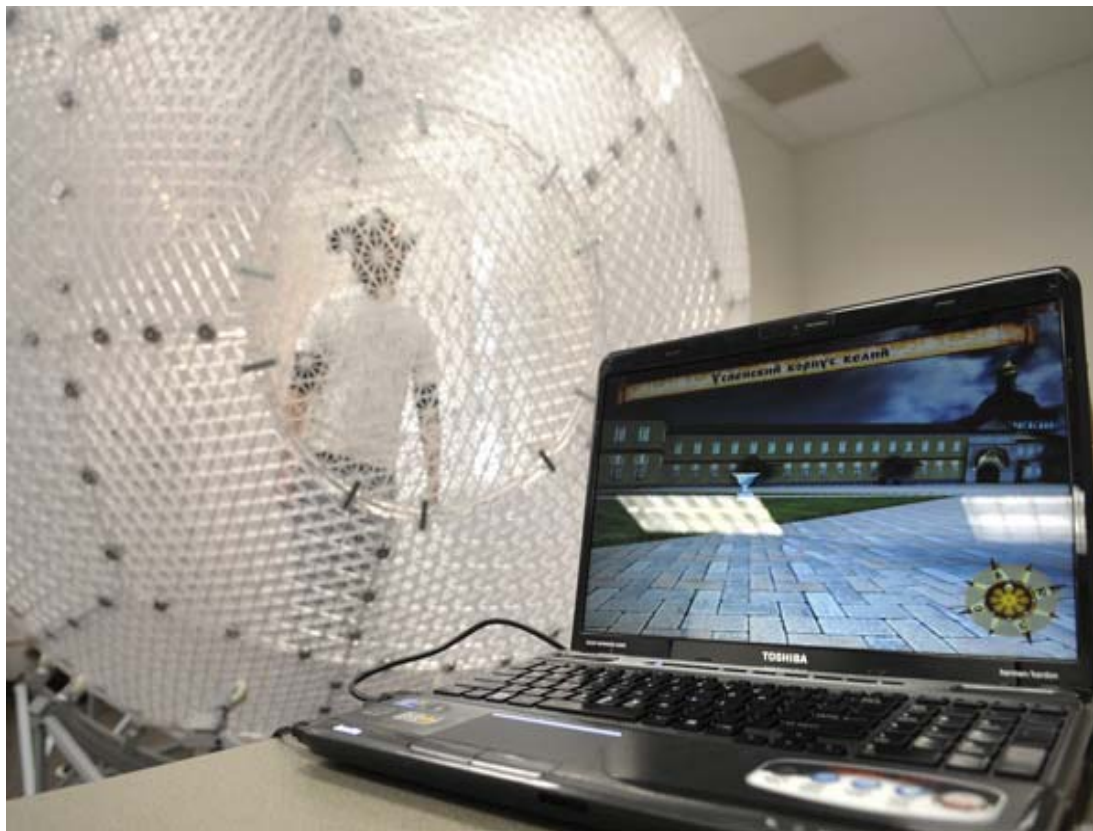
"The soldiers are immersed in a full 3D virtual world," says West. "They can hear birds and the sound of bullets whizzing by. They can see and hear other squad members who are near them in the virtual environment, but otherwise they can't – even if the soldier is standing right next to them in the physical world."

Gaming has been a part of military training for centuries, notes Andy Petroski, director of the Learning Technologies Master of Science program at [Harrisburg University of Science and Technology](#) in Pennsylvania. In the 1940s and 50s, the US military adopted simulations as a training strategy, he adds.

"The serious game industry is an offshoot of military simulators," says Petroski. "The technology and skillsets required to create games and simulations have simply gotten a lot more consumer-friendly and affordable."

But besides combat operations and flight sims, the military uses gaming software to train noncombat personnel in business-related tasks such as procurement, engineering, and facilities management, he adds.

Harrisburg University is also the home of the [Virtusphere](#), a 10-foot-wide hollow plastic ball resting on a metal base that serves as a mobile environment for 3D simulations. Users don a head-mounted display and enter the ball, which then responds to their movement, rolling in place as they walk or change direction. The university is researching how to use the sphere to train law enforcement, first responders, and military combat personnel, says Petroski.



Virtusphere

Source: Harrisburg University of Science and Technology

Not surprisingly, systems like the DSTS are a hit with younger soldiers who grew up immersed in the world of video gaming, says John Matthews, director of the Army's Dismounted Soldier project.

"The guys age 18 to 29 really love this thing," he says. "They have no problem adjusting to the toggle switch or the immersive environment. The older soldiers need a little more time to get used to it. But once older non-commissioned officers realize we can fit five days worth of training into just one day with this system, they get right on board with it."

Building this kind of sophisticated technology into a system that's both lightweight and rugged isn't cheap, however. The total price tag for each DSTS kit: roughly half million dollars, not counting the salaries of the two technicians that keep each kit up and running in the field, says Matthews.

The biggest challenge was getting enough computer horsepower into the system yet still have it remain relatively portable, says Anthony Howard, an IT consultant and book author ([The Invisible Enemy: Black Fox](#)) who helped architect the hardware infrastructure for Intelligent Decisions.

"The system needed to be powerful enough to meet the Army's requirements, light enough to be carried by two people, yet rugged enough to withstand the extreme weather conditions you might encounter," he says. "This was not your typical system."

Still, adds West, being able to bring the training to the soldiers wherever they are – even on the front lines – is ultimately less costly than transporting them to centralized training centers or building new facilities at each base.

The beauty of the DSTS lies in its flexibility, notes Matthews. As the US enters different war scenarios in real

life, the virtual environments can be programmed to match them. The Army is working on ways to add [haptic](#) feedback to each soldier's gear – so if he or she is hit in the arm, they know exactly when and where it happened. And while the current system is built around the Virtual BattleSpace 2 (VBS2) gaming engine used in first-person shooters like Arma3, West says Intelligent Decisions is looking at more advanced gaming engines that can bring a greater degree of photo realism to the action.

"We are always trying to push it to the next level," says West. "Visual cues are very important in the field – you need to be able to see the disturbed soil or the discolored cement where an IED may have been placed. We owe it to our soldiers to bring them the highest fidelity we can muster."

This kind of public-private tech partnership is increasingly common, says Petroski.

"At one time it was the military that developed new technologies which eventually made their way to business," he says. "Now it's much more collaborative. Businesses can build prototypes more quickly in many cases, while the military can have a bigger impact on innovations that require large investments."

The bottom line, adds Howard, is that this technology will ultimately save lives.

"I was told the army had a problem," he says. "Sometimes the enemy was hiding out in places that had already been bombed. We were losing troops in cities we'd already taken. But using this system we can recreate the cities and show the troops how to clear them out and what to watch out for. And they can repeat it as often as they need until they get it right."

And that's something you can't really learn from Modern Warfare or Call of Duty.

"Unlike with the Xbox, you only get one life in the trenches," he says. "This technology helps our troops come home safely."

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