

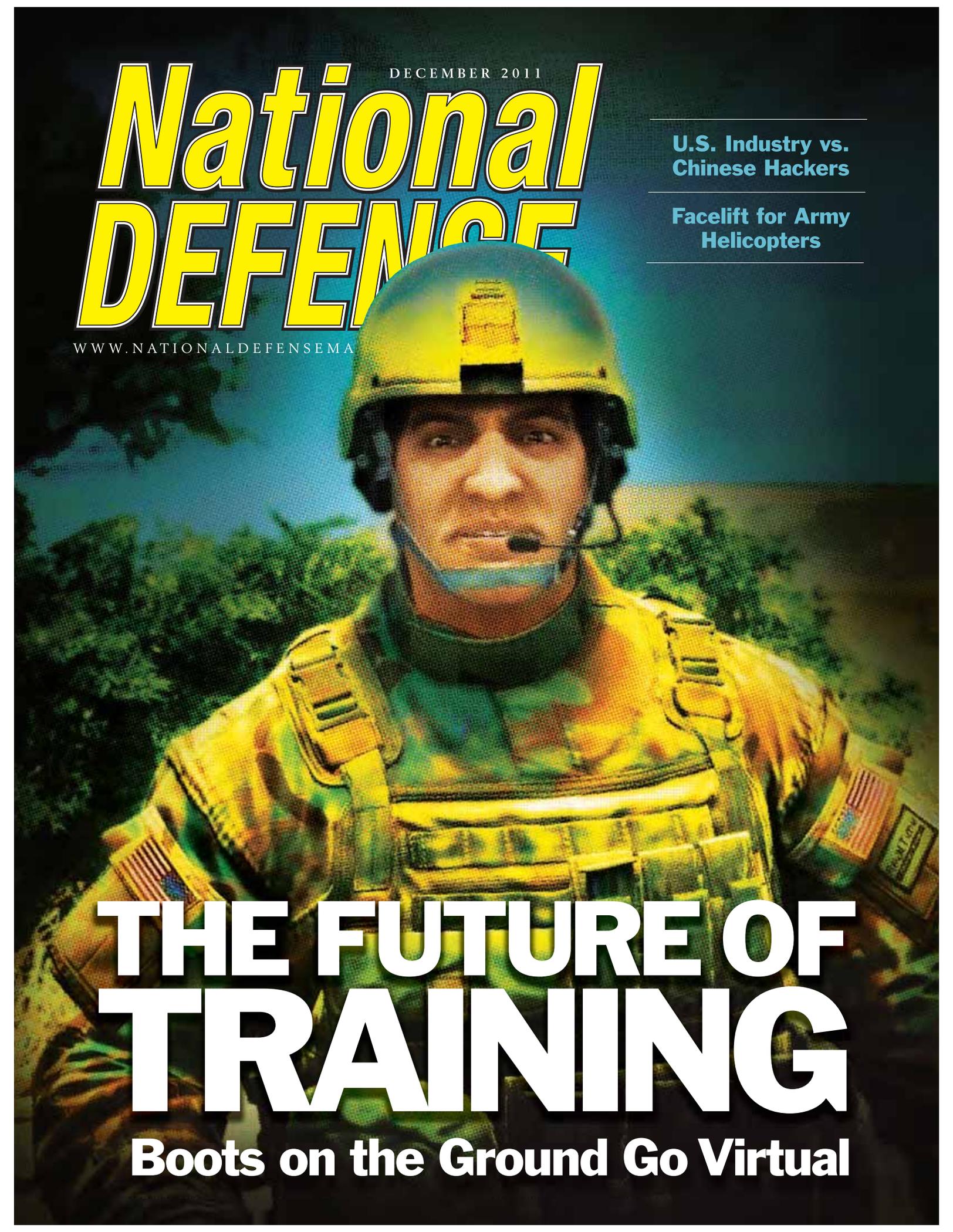
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THE FUTURE OF TRAINING

Boots on the Ground Go Virtual

Defense Technology Newswire

BY ERIC BEIDEL



Army Enlists More Help from Tiny Robots

■ **Soldiers in Afghanistan** want their own personal robots to scan the insides of buildings and find homemade bombs.

The Army is granting those wishes.

The U.S. military paid \$5.8 million for 385 micro-robots from Recon Robotics this summer, and the Army immediately followed that up with an order for 315 more. The devices are deployed at the fire team level, with each four- or six-member unit sharing a robot.

The company's Recon Scout XT weighs 1.3 pounds and can be tossed up to 120 feet, hence why they are sometimes called "throwbots." They can be controlled by a single button to help map and clear compounds, as well as to identify the location of improvised explosive devices, enemy fighters, friendly forces and local residents.

Up to three robots can be used simultaneously at the same location. They can traverse a variety of terrains including rocks, sand and cluttered interiors. They can climb over door thresholds and other objects and come equipped with an infrared optical system that automatically turns on when light is minimal.

The XT can be deployed in about five

seconds. In a training video, a soldier pulls an activation pin on the robot and tosses it through the basement window of a building. The robot bounces on the concrete floor and steadies itself as the soldier begins to move it with a joystick from the outside. Other demonstrations show the device being thrown up on a roof and down a trapdoor, allowing troops to watch armed enemy fighters before entering a building or being seen.

The recent orders represent the emphasis being placed on micro-robots, says Ernest Langdon, director of military programs at Recon Robotics, a firm created in 2006 to commercialize technology developed at a University of Minnesota laboratory with funding from the Defense Advanced Research Projects Agency.

"The era of the personal robot has arrived for U.S. troops," Langdon says.

The majority of ground robots deployed to Iraq and Afghanistan weigh 40 pounds or more and are typically used at the company level. But the U.S. military and its allies are turning to smaller machines, and there are now 2,000 Recon Scout robots deployed around the world.

"These robots provide immediate visual reconnaissance that saves lives, but they do so without substantially increasing the carry burden of our dismounted fire teams," Langdon says.

Algae Holds Power to Extend Battery Life

■ **The Navy has proven** it can power its boats with algae-based fuel. Now, scientists may have discovered another reason for the military to harvest it.

Researchers at Georgia Tech and Clemson University believe that material extracted from common brown algae can be used to bind lithium-ion batteries, boosting their ability to store energy. This refined alginate could do wonders for troops bogged down with batteries, replacements and chargers needed to operate electronic gear on the battlefield.

"While nature certainly did not intend to help us make better energy storage devices, we identified similarities in the material requirements for making better, longer-lasting batteries and those for the growth of aquatic plants," says Gleb Yushin, an assistant professor at the Georgia Institute of Technology's school of materials science and engineering.

Alginates are commonly employed as a binding material in foods such as ice cream. Because they can neutralize hydrochloric acid, they also are used to form a gel that protects the inner surface of the stomach from bleeding ulcers. The same properties allow the material to slow battery degradation, Yushin explains.

A battery could last 10 times longer if it were bonded with alginate, he says. The new binder also is less expensive than those traditionally used, which could make it especially attractive to industry. In addition to implications for the battlefield, the discovery could touch many aspects of everyday life, he says.

For starters, cell phones and notebook computers could be used for longer periods without requiring an electrical outlet. Batteries bound with alginate also could help get more electric cars on the road, Yushin says.

