



DEFENSE TECHNOLOGY MONITOR

The American Foreign Policy Council's Review of
Developments in Defense Technology

Defense Technology Monitor: No. 15

March 28, 2017 **Richard M. Harrison, William Mallard**

Related Categories: Cybersecurity and Cyberwarfare; International Economics and Trade; Military Innovation; Missile Defense; Science and Technology; Iraq

WASHINGTON, TOKYO PLOT FUTURE OF MISSILE DEFENSE

In light of several recent missile launches by North Korea, the U.S. and Japan are focusing their efforts on improving regional missile defenses. The latest successful test of the SM-3 Block 2A, a ballistic missile interceptor developed by Raytheon as an upgrade to the currently deployed SM-3 Block 1A and 1B, is considered a vital foundation of the Aegis Ballistic Missile Defense system jointly in use by the U.S. and Japan to defend against medium and intermediate-range missiles from North Korea. According to Riki Ellison, chairman of the Missile Defense Agency Alliance, the new SM-3 Block 2A interceptor has twice the range of its predecessors, which will allow U.S. and Japanese ships to maintain forward firepower capabilities from a greater distance from shore. This, in turn, will minimize the risk of casualties and damage from a direct attack by an adversary, and will allow the Navy to both attack and defend a much wider range of territory. (*Space News*, February 7, 2017)

DARPA'S NEW DRONE CATCHER

The Pentagon's Defense Advanced Research Projects Agency (DARPA) has developed a new technology capable of catching drones in mid-air. The tech, dubbed "Project Sidearm," operates like the cable system that catches jets landing on Navy aircraft carriers: a hook attached to the drone catches on an overhanging cable, arresting its progress and causing its nose to swing upward into a safety net. The Pentagon research team involved in the project estimates that, when it is complete, the system will be able to catch a drone weighing close to 1,000 lbs. The unit folds away into a 20-foot shipping container for easy transport, and can be operated by two to four people. Additionally, the system is able to launch drones into the air in a manner similar to a catapult. The new capability has significant future applications, eliminating the need for fixed wing aircraft to use a runway for take-off and landing - a problem that currently complicates both surveillance and humanitarian missions in conflict zones. (*Engadget*, February 6, 2017; *Wired*, February 7, 2017)

IBM'S WATSON WORKS TO BOLSTER CYBERSECURITY

Amid a surge of hacking and cyber espionage incidents, computer giant IBM has tasked its premier cognitive software with tracking software vulnerabilities. "Watson For Cyber Security," as the program is called, utilizes the machine learning software's advanced capability to quickly read and digest terabytes of information, making it an important cyber-defense tool. Watson will use its "learn on the go" ability to sift through cyber systems and identify potential vulnerabilities where a cyber intruder might be able to break into a network. Initial tests of Watson's effectiveness have resulted in the identification of numerous software breaches and vulnerabilities not previously spotted by human analysts. (*Forbes*, February 13, 2017)

ATMOSPHERIC LASER SHIELD IN THE WORKS

Scientists at defense contractor BAE Systems are working hard to make science fiction a reality. Researchers believe that the company's new Laser Developed Atmospheric Lens (LDAL) concept - which utilizes a directed energy laser system and the Earth's natural ionosphere to make a sort of "laser shield" - could help the U.S. military block laser attacks from enemy forces, while simultaneously allowing military commanders to conduct a wider range of intelligence, surveillance and reconnaissance (ISR) functions than currently possible with modern sensors. The LDAL mimics two principles of nature, the refractory nature of the ionosphere (which allows radio signals to bounce around the globe) and the "desert mirage" effect that produces the image of lakes and oases in the desert. Combining these two phenomena by directing a high powered laser to heat a small segment of the Earth's atmosphere, the LDAL system refracts light and radio signals coming from a certain geographic area, augmenting the ISR capabilities of battlefield forces over a much wider swathe of territory. (*Space Daily*, February 22, 2017)

DRONE OPERATORS TO GET AI "WINGMEN"

Drone operators may soon find that their UAV squadrons contain drones run by artificially intelligent systems. Scientists with the Naval Research Laboratory (NRL), the Air Force Research Laboratory (ARL), and Naval Air Systems Command (NAVAIR) have teamed to develop significant upgrades to the NRL's Tactical Battle Manager (TBM) software, which uses intelligent agents to guide unmanned aerial vehicles to serve as "wingmen" in unmanned/manned combat missions. The system is designed so that a human operator controls the lead vehicle while being connected through the TBM system to multiple autonomous "wingmen." The AI driven drones will be capable of autonomously prioritizing mission objectives and acting accordingly in the absence of a human lead plane operator in "highly contested environments." Expert pilots have so far been impressed with the TBM system's management of UAVs during aerial warfare simulations. (U.S. Navy, February 22, 2017)

ISIS DRONE INNOVATIONS COMPLICATE BATTLE IN IRAQ

The Islamic State terrorist group has changed its drone warfare tactics, moving from simple model-airplane type drones used for reconnaissance purposes to advanced quad-copter type drones that drop munitions on Iraqi troops. As the push to retake Mosul intensifies, ISIS is continually refining the versatility and accuracy of this capability, with significant effect. Iraqi forces have noted an increase in the rate and accuracy of munitions dropped by ISIS drones, which have been used to target aid and relief workers in East Mosul, and often serve as a distraction for a corresponding suicide attack. (Wall Street Journal, February 25, 2017)