



DEFENSE TECHNOLOGY MONITOR

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January 6, 2021 **Richard M. Harrison**

Related Categories: Cybersecurity and Cyberwarfare; Military Innovation; Science and Technology; China; Europe

ROBOTIC REPLACEMENTS FOR BRITISH TROOPS

Militaries around the world have been exploring the numerous ways in which machines can augment humans on the battlefield. However, according to British Army General Sir Nick Carter, the United Kingdom would like to go a step further and replace 25 percent of its troops with automatons by the 2030s. Currently, the UK has Army troop recruitment shortfalls of around 10 percent, so the added robotic soldiers could help close that gap while also removing humans from the front lines. However, in light of the strong opposition to lethal robots that prevails among the British populace, it is not yet clear if the robotic troops will serve as infantry forces or be relegated to tasks like moving cargo and scouting missions. (*Engadget*, November 8, 2020)

CHINA'S NEW HIGH-ALTITUDE EXOSKELETON

There may never be an Iron Man exoskeleton of the sort portrayed in the movies, despite the fact that some countries are working toward one (see *Defense Technology Monitor* no. 41). Nevertheless, exoskeletons are increasingly finding military roles. The Chinese military, for instance, has developed a suit specifically for use in high altitude climates (around 11,500 feet), where human strength is normally reduced by 25 percent. According to Zhang Lijian, Director of Human Function Enhancement Technology Research center at the China Aerospace Science and Industry Corp (CASIC), the carbon fiber exoskeleton can conserve up to 80 percent of energy usually expended while carrying a 55lb load while the wearer is standing, and up to 10 percent while he or she is out walking on patrol. Reportedly, the system is available for \$7,500 per unit, and can be removed by a soldier in as little as 10 seconds. (*Global Times*, November 11, 2020)

6G JUST OVER THE HORIZON

Over the past year, debate has raged over whether China can be relied upon to provide secure 5G technology. That discord looks likely to continue — and to migrate to encompass future 6G technology. Despite a reduced market for its planned 5G technology rollout, the PRC has continued to pump funding into R&D and advance communications technology, something evidenced by the recent launch of the first 6G satellite. 5G refers to fifth-generation cellular broadband, which offers dramatically enhanced connectivity. But the Chinese satellite, *Tianyan-5*, is reported to operate in the Terahertz wave spectrum, providing even faster data transfer rates than those available in 5G. However, the effectiveness of the nascent technology is still unclear, because 6G is likely to have atmospheric limitations due to variables like water vapor. (*Popular Mechanics*, November 20, 2020)

UP NEXT: BALLOON BATTLESTATIONS

The U.S. Army is looking to fill an intelligence, surveillance, and reconnaissance (ISR) gap between traditional ground and airborne systems and space-based sensor platforms. The potentially optimal solution is to use high-altitude balloons that operate in the 23,000 to 66,000 foot altitude range, near or above adversary territory. According to Brent Fraser, leader of the U.S. Army's Concept Development Division, "[the balloons would] be able to provide some beyond-line-of-sight capability, whether it's communications, extended distances, to be able to provide the ability to enable sensing of targets deep in the adversary's areas, to be able to reinforce and complement existing sensing systems other than the aerial layer as well as the space layer." The small radar signatures of the balloons make them an effective platform and, in addition to ISR missions, they could also be used to launch swarms of drones or carry electronic warfare packages. (*The Drive*, November 30, 2020)

SIMULATED WEAPONS JUST GOT REAL

For years, the Pentagon has been relying on synthetic environments to enhance military readiness using digital platforms for weapons testing (*Defense Technology Monitor* no. 30) and virtual reality training (*Defense Technology Monitor* no. 44). Despite some shortcomings (*Defense Technology Monitor* no. 49), the military is making some advances in this field. In the latest development, the military has evolved from using the laser-based (MILES) weapons training system to employing an "ebullet," which accurately simulates flight paths to a seventeenth of a degree and emulates numerous weapon systems. This represents a dramatic improvement for training, because bullets do not behave the way lasers do, and do not necessarily travel in straight lines. According to Frank Tucker, the Army Futures Command lead for the Synthetic Training Environment, "[MILES] has only been able to simulate 60 percent of the current inventory of weapons... The Army now can dream up a new weapons system and synthetically deploy it in a training exercise to see how it works or doesn't work, without bending metal." Even more impressively, the ebullet may soon be able to simulate how bioweapons and electronic warfare operate in training environments. (*Breaking Defense*, November 30, 2020)