



# Defense Technology Monitor No. 81

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**Related Categories:** Military Innovation; Science and Technology; SPACE; China

## A VIRTUAL LIE DETECTOR

Currently, lie detection capabilities rely heavily on polygraph technology, which requires the subject to be physically present in a room in order to be questioned. However, a team of developers at Israeli start-up Valid.it has created a new lie detection method that can test people remotely – and virtually. The Valid.it program records participants on a video call with a selfie camera and a microphone in order to observe a variety of variations in facial expression, eye movement, and voice. The Valid.it test is also significantly more detailed than a traditional polygraph. According to Valid.it co-founder Yossi Penias, "When you measure bioscience through a camera, there are almost 40 indications of the sympathetic system that you can gather. The [traditional] polygraph only takes five." The technology was born out of an understanding on the part of former Israeli security agency officials of the need for greater capabilities to verify information in advance of security operations. (*Jerusalem Post*, August 7, 2022)

## CHINA INVESTS IN TRANSMEDIA VESSELS...

Unmanned aerial vehicles (UAVs) and unmanned underwater vehicles (UUVs) are increasingly common military platforms capable of conducting surveillance operations, attacking enemy targets in the air, or inspecting mines underwater. However, a research team from Nanjing University of Aeronautics is developing and testing a drone that can both fly and dive underwater — something China refers to as a "transmedia vessel." The craft is capable of submerging in order to avoid radar detection, or conversely rising and taking flight if pinged by the sonar of an adversary vessel. The Chinese researchers reportedly believe that these vessels, if deployed in sufficient numbers, could pose serious problems for the multilayered defenses of adversaries, and are eyeing it as a "powerful supplement to the Chinese Navy's existing equipment, combat methods, and tactics." The U.S. Navy has also studied the feasibility of submersible aircraft under projects at the Defense Advanced Research Projects Agency (DARPA). (*The Eurasian Times*, August 10, 2022)

## ...WHILE THE U.S. RAISES PLANES FROM THE DEAD

Due to ongoing technological innovation, the U.S. Air Force has retired countless aircraft in favor of newer, more modern vehicles. These retired planes are sent to aircraft graveyards, despite the fact that they are often still functional flying machines. Rather than allowing these aircrafts to slowly deteriorate, war analyst Zachory Kallenborn recently proposed resurrecting these old planes and reinstating them in the American air fleet — but not as crewed aircraft. Rather, Kallenborn suggests that old planes get retrofitted with autonomous or semi-autonomous systems, so they become *de facto* drones. The revitalized planes could be used in roles that are highly dangerous for humans, like attacking enemy air defense networks. The drones could be loaded with bombs, or even utilized as cruise missiles to attack large targets. While the Air Force revives old aircraft in some instances, like converting old F-16s into uncrewed QF-16s for targeting exercises, it has yet to implement a full-scale program to the degree that Kallenborn suggests. (*Popular Mechanics*, August 18, 2022)

## U.S. SPACE COMBAT TRAINING BEGINS...

The danger of American satellites and other space assets being targeted by our adversaries is a pressing problem that the U.S. military is focused on addressing. Recently, the Space Force conducted a space warfare exercise for its Guardians, Airmen, and Soldiers which simulated events and crises that could occur in an outer space conflict. Specifically, the simulation, known as Flag 22-3, incorporated both non-destructive and destructive attacks on American space assets with a variety of different weaponry, including directed energy and kinetic attacks. Reportedly, the training exercise "challenged players to consider complex astrodynamics while maneuvering and operating during simulated on-orbit combat engagements." The simulation provided the U.S. military with an opportunity to "refine combat tactics in space domain awareness, intelligence, warning and surveillance, navigation warfare, orbital warfare and satellite communications." (Space.com, August 24, 2022)

### **...AS CHINA TESTS A REUSABLE SPACE PLANE**

Spaceflight is rapidly becoming a more efficient endeavor due to the development of reusable launch systems, particularly by private sector companies like SpaceX and Blue Origin. Now, researchers in China are testing their own reusable spacecraft design. The Chinese Aerospace Science and Technology Corp, a state-owned company, has stated that it tested a space plane from the Jiuquan Satellite Launch Center which completed a suborbital space flight and landed back on a runway in Inner Mongolia. The test was significant because it marked the second flight of the vehicle, highlighting its reusability. The company called the reusable spaceplane "a milestone in China's path toward a world-class space power." Such a vessel could be used for transporting both people and cargo into orbit. Furthermore, the concept of a space plane has several advantages over traditional rockets, including easier assembly and lower costs. (*Space War*, August 28, 2022)