

Dear Reader,

With the publication of the [NATO ACT Strategic Foresight Analysis 2023](#), this edition of the Deftech.Scan illustrates some of the mentioned trends and convergences. This is of course no real surprise, but it does definitely underline the challenges of long term anticipation as the horizon seems always closer !



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We wish you an interesting read.

Foresightfully Yours,

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1. Applications of AI and data

<p>1.1</p>	<p>Convergence at the crossroads: Opportunities and risks at the intersection of biology and machine learning</p> <p>The RAND Corporation published two articles in March investigating different aspects of the intersection of synthetic biology and machine learning: genetic engineering and a mass biological attack. These articles help highlight the importance of AI not only as a stand-alone amplifier of capabilities but also how it can combine with other fast-moving emerging technology fields to create new opportunities and risks. (source and source)</p> <p><i>Assessment:</i> A 21 March article examined the benefits and risks associated with AI-enabled genetic engineering and synthetic biology more broadly. It begins by observing that “machine learning is already helping scientists make sense of the genetic keys that could unlock new crops, new drugs and vaccines—or new viruses.” However, the piece also emphasises the dilemma for governments and defence and security communities seeking to capitalise on the opportunities presented by the convergence of two fast moving scientific fields, asking “how do you push open the door for new crops and cancer treatments, without leaving it open for a computer-generated catastrophe?”</p> <p>To address this dilemma, the RAND team examined how China, the United States, United Kingdom, and European Union are approaching regulating these industries both individually and in conjunction with one another. For example, in 2023, U.S. President Joe Biden issued an executive order calling for much stronger safeguards on artificial intelligence and synthetic biology. However, development in the technologies is moving faster than policymakers can keep up both at the national and, especially, multi-national level. As RAND researcher Sana Zakaria notes, some degree of global coordination on norms and standards is required, else individuals looking to do gene editing will simply find locations with less stringent regulations.</p> <p>The second article revealed the outcomes of a recent RAND Red Team experiment examining whether and how machine learning can help make large scale biological terrorist attacks more efficient and deadly. The experiment involved bringing together several computer science, biology, and operational planning experts from throughout the world and dividing them into small teams. Some of the “Red Teams” had access to large language models (LLMs) while others could only consult the internet. The study produced several layers of interesting and relevant outputs:</p> <ul style="list-style-type: none"> • The good news: There was not an appreciable advantage for teams using LLMs. Most LLM plans were judged to have “major flaws and fell somewhere between problematic and unworkable.” • The disturbing news: The models did respond to queries on how to make biological attacks more deadly and provided instructions for cultivating particular types of harmful bacteria. • The more disturbing news: The damaging information provided by the model is also available “with a few clicks on the internet”, meaning that this data is already accessible to a broad group of individuals and organizations.
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1.2

More on AI and Weapons of Mass Destruction (WMD): AI, strategic escalation, and control of nuclear weapons

The United States has urged China and Russia to pledge that humans will always retain control of decisions related to the deployment and use of nuclear weapons. A recent study by U.S.-based academic reveals escalatory tendencies of LLMs employed in strategic and diplomatic decision-making roles, reinforcing the potential dangers of AI control of nuclear weapons ([source](#) and [source](#))

Assessment: On 2 May, U.S. Department of State arms control official Paul Dean urged Russia and China to join the United States, France, and the United Kingdom in making explicit their commitment that humans would retain total control over the deployment and use nuclear weapons. Mr. Dean added that such declarations are “an extremely important norm of responsible behaviour and we think it is something that would be very welcome in a P5 context”—referring to the five permanent members of the United Nations Security Council.

The call for commitments to human control of nuclear weapons comes as militaries around the world seek to better understand the risks and opportunities associated with the use LLMs to support military activities and operations, including potentially in support of strategic military or diplomatic decision-making, including the decision to engage in or escalate conflict.

However, [an academic study published in January](#) by several U.S.-based academics tested the behaviours of five LLMs with a specific focus on understanding how these AI agents operate in simulated wargames and their “predilection to take escalatory actions that may exacerbate multilateral conflict.” The study found that models tend to develop “arms-race dynamics, leading to greater conflict, and in rare cases, even to the deployment of nuclear weapons.”

The study also found that the models’ “reported reasonings for escalations were rooted in “worrying justifications based on deterrence and first-strike tactics”, leading the authors to suggest that “cautious consideration” be given to the deployment of autonomous LLMs in a strategic decision-making function.



<p>1.3</p>	<p>South Korea launches Defence Artificial Intelligence Center; to host AI Safety Conference</p> <p>In a 1April ceremony, the South Korean Defence Ministry launched a new think tank and research and development centre to explore AI solutions. The induction ceremony took place only weeks ahead of the country hosting the second AI Safety Summit and reflects the growing relevance of AI to future military capabilities as well as South Korea’s efforts to become a global leader both in AI development for military purposes and in the establishment of norms around the development and use of AI. (source and source)</p> <p><i>Assessment:</i> The launch of the new centre is part of South Korea’s Defence Innovation 4.0 initiative, which seeks to use AI and other emerging technologies to make the military smaller but more effective.</p> <p>According to reporting from Airang News’ YouTube channel, Defence Minister Shin Won-sik attended the service and stated that the new centre will be “a cornerstone for the acceleration of the creation of a scientific and technological powerhouse.” The centre will be staffed by 110 people, including private sector researchers with expertise in AI development as well as military personnel. A key objective of the centre is to foster collaboration with the private sector, including South Korea’s high-tech industry as well as its rapidly advancing defence industry, and to more quickly adopt private sector solutions for the military.</p> <p>The announcement comes a few weeks ahead of the second AI Safety Summit, which is being hosted virtually by South Korea on 21 – 22 May. The first AI Safety Summit was hosted in Bletchley Park in the United Kingdom in late 2023 and led to the Bletchley Statement, in which signatories from 25 countries, including the United States and China signed agreed to cooperate on AI safety. However, to date, The South Korea event appears to have less momentum than the original in-person event in the United Kingdom with Reuters reporting that the event is being billed as a “mini-summit” and that several nations are choosing not to attend. South Korea also served as a “co-host” for the February 2023 Responsible AI in the Military (REAIM) domain summit, which was held in The Hague, Netherlands.</p>
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2. Robotics and Autonomous Systems

<p>2.1</p>	<p>Austal completes trial of refitted patrol boat for autonomous operations</p> <p>The proof-of-concept <i>Sentinel</i> vessel successfully completed autonomous and navigation trials as well as endurance trails in March and April demonstrating the capacity of Australian industry to modify decommissioned platforms to carry out uncrewed autonomous operations. (source (fire-walled) and source)</p> <p><u>Assessment:</u> On 23 April, Australian shipbuilder Austal announced it has completed autonomous and remote navigation sea acceptance trials of a former in-service Australian patrol boat, the RAN Armidale-class HMAS <i>Maitland</i>. The effort to transform the crewed platform into an autonomous, optionally crewed, vessel is part of the Patrol Boat Autonomy Trial (PBAT) program, which involves collaboration between Austal, the Royal Australian Navy's Warfare Innovation Navy Branch, Greenroom Robotics, and the Trusted Autonomous Systems Defence Cooperative Research Centre. The program was established to deliver robotic, autonomous, and automated elements on a former navy patrol boat and to provide a proof-of-concept demonstrator for optionally crewed or autonomous operations.</p> <p>The project's testbed ship, now known as <i>Sentinel</i>, was decommissioned in 2022 and has undergone significant modifications to enable remote and autonomous operations, including to its navigation, communications, bilges, CCTV, and electrical systems. The 57-meter ship also incorporates Greenroom Robotics' Advanced Maritime Autonomy software (GAMA) and supporting sensors.</p>
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Figure 1: The *Sentinel* test-bed vessel. source: Austal via Janes



2.2 U.S. Air Force moving forward with autonomous aircraft and Collaborative Combat Aircraft technologies

The U.S. Air Force and Department of Defense (DoD) made multiple announcements over approximately two weeks in April that indicated progress in developing autonomous uncrewed aerial systems (UAS), including UAS capable of operating in conjunction with crewed aircraft.

([source](#), [source](#), [source](#))

Assessment: The U.S. Air Force is making significant investments in the development of autonomous aircraft in its effort to match the challenges of scale and cost presented by China’s military modernization. The cost of the U.S. tactical air force has grown prohibitively expensive to meet the range and sheer number of aerial threats presented by advanced platforms, missiles, and uncrewed systems. While F-15s, F-16s, F-22s, and F-35s are all capable aircraft, they are tens of millions of dollars per copy while the Next Generation Air Dominance (NGAD) program is estimated to cost in [the hundreds of millions of dollars to field, though this top line number will reportedly include the whole family of systems \(including uncrewed systems\) involved in the sixth generation fighter.](#)

In April, the Service made three announcements that revealed progress and sustained and maturing interest in developing autonomous tactical aircraft generally and in advancing the Service’s Collaborative Combat Aircraft (CCA, or Loyal Wingman), in particular.

First, [on April 9, Secretary of the U.S. Air Force Frank Kendall announced that he would fly in an F-16 that has been converted for development of autonomy technologies](#), along with an Air Force pilot. According to Kendall, both will be watching “as the autonomous technology works.” That flight occurred in early May, with Secretary Kendall flying in an X-62A VISTA (Variable In-flight Simulator Aircraft), which is a heavily modified F-16 used to test autonomous flight capabilities. The X-62A flew against a crewed F-16 in a simulated dogfight for approximately an hour. In remarks after the test, Kendall observed that not developing AI-enabled autonomous aircraft is [“a security risk” and that the United States “\[has\] to have it.”](#)

While the May demonstration of the X-62A’s ability to autonomously dogfight was impressive it was not the first time the aircraft had demonstrated this capability. Previously, [on April 19, the Air Force and Defense Advanced Research Projects Agency \(DARPA\) announced that in September 2023 the two organizations successfully carried out a test in which an AI-piloted fighter aircraft engaged in a series of dogfights against a human piloted aircraft.](#)

The tests were considered an important step forward in autonomous systems development, given that, as Colonel James Valpiani, commandant of the Air Force Test Pilot School noted, “dogfighting presents a very important challenge case for the question of trust” in autonomy. [“It’s inherently very dangerous. It’s one of the most difficult competencies that military aviation must master.”](#)

Finally, [on 24 April, the Air Force announced that Anduril and General Atomics-Aeronautical Systems \(GA-ASI\) were down-selected from five competitors to build and test drone prototypes for the next phase of the Service’s CCA program.](#) Other competitors included Boeing, Lockheed Martin, and Northrop Grumman. The CCA program is designed to field as many as 1,000 drones capable of carrying out a range of missions in partnership with crewed aircraft with the aim of fielding a fully operational capability by the end of the decade. GA-ASI’s entry in the competition is based on the company’s Gambut drone family while Anduril’s entry is the Fury drone, made by recently acquired Blue Force.



2.3

Demographics, cost, and capability: Japan’s Ground Self-Defence Force (JGSDF) bets on uncrewed systems

In March and April, the JGSDF made announcements that demonstrated the organization’s growing focus on uncrewed ground vehicles (UGVs) and UAS to build capability and mitigate against demographic and budgetary constraints ([source](#), [source](#), [source](#))

Assessment: On 26 March, the JGSDF announced via its social media account that it will acquire more UAS and UGVs for testing and evaluation to accelerate widespread adoption of these systems across the JGSDF.

[A JGSDF statement cited the need to](#) “fundamentally strengthen defence capabilities”, including reconnaissance and transportation, to gain advantages in the air and on the ground while limiting personnel risk.”

Acquired systems include Rheinmetall Canada’s Mission Master 8x8 all-terrain UGV. Japan [reportedly](#) selected the Silent Partner (SP) electric propulsion variant that is built for forward and last-mile resupply missions, silent watch operations, and carriage for light payloads such as sensors and weapon systems. The SP Mission Master has a modular design, allowing for interchanging of 600kg payloads on land and 300kg payloads during amphibious operations. Japan’s versions will be equipped with cargo, surveillance, and a remote-controlled weapon station module and is expected to be delivered in 2025.

In addition, on 16 April Milrem Robotics, an Estonia-based company owned by UAE’s Edge Group, announced it had secured a contract with the JGSDF for delivery of three THeMIS modular UGVs for training.

Earlier in January, the JGSDF’s Ground Material Control Command (GMCC) announced competitive tenders for concept demonstrations of two types of cargo UAS. According to the [Asian Military Review](#), the GMCC has “also actively invited bids for a diverse array of projects including capability upgrades for reconnaissance UASs, concept demonstration for a multi-role fixed wing UAS, as well as technical assessments related to communications for disaster response UAS.”

Demographics are among the main drivers of Japan’s growing interest in uncrewed systems across domains but especially by the JGSDF. Japan’s military acquisition agency, the Acquisition, Technology and Logistics Agency (ATLA) noted that Japan’s shrinking and ageing population is limiting the pool of recruits available to the military, observing that “[it is important to promote efforts for automation, labour saving optimization through utilizing unmanned assets, including UGVs.](#)”



Figure 2: MILREM Robotics’ THeMIS modular UGV. Source: [MILREM Robotics](#)



2.4

Massive Manta Ray breaks cover

DARPA announced that the very large uncrewed underwater vehicle (UUV) prototype completed its first in-water testing earlier in 2024, confirming the novel design and concept's hydrodynamic capabilities and operational readiness. ([source](#) and [source](#))

Assessment: The Manta Ray is built by Northrup Grumman in support of DARPA and is designed to operate for extended durations without the need for human-present logistic support or maintenance, allowing the system to carry out persistent operations in forward environments.

The program is also a testbed for several new technologies for a long duration, long range, payload capable UUVs, including: 1) novel energy management techniques and undersea energy harvesting techniques at operationally relevant depths; 2) low-power, high efficiency undersea propulsion systems; 3) new low-power means of underwater detection and classification of hazards of counter detection threats; 3) mission management approaches for extended durations; 5) unique approaches for leveraging existing maritime data sets and exploiting maritime parameters for high-efficiency navigation and/or C3; and 6) new approaches to mitigate biofouling, corrosion, and other material degradation for long-duration missions.

The Manta Ray design is modelled on the manta ray sea creature. For the test, the vessel was shipped in subsections from its build location in Maryland to its test location in California where it was reassembled, validating another aspect of the concept—the relative ease of transportation and assembly. While the precise missions the Manta Ray and the future class of UUVs the DoD hopes the program creates, it appears capable of serving as a mother ship for other, smaller, UUVs as well as carrying out undersea mapping, mine detection, and passive and persistent surveillance



Figure 3: The Manta Ray UUV is a very large UUV capable of long-duration operations. Source: Northrup Grumman



3. New Weapons

3.1	<p>Spoofed and jammed: Growing challenges to GPS – based navigation</p> <p>The reporting period included multiple developments and incidents that demonstrated the vulnerability of both military and commercial GPS-based navigation to proliferated and advanced jamming and spoofing capabilities. The imbalance in the EW attack and defence competition is diminishing the value of some weapons in Ukraine and revealing stark risks in commercial aviation (source and source)</p> <p><u>Assessment:</u> In late April, a U.S. DoD representative revealed that an unnamed weapon believed to be the Ground-Launched Small Diameter Bomb (GLSDB) had been rendered ineffective in Ukraine by Russian EW efforts. Ukraine has used the weapon since February 2024. However, Russian forces have been able to jam or spoof (provide false targeting data) the weapons’ GPS signals to the degree that Ukraine is unlikely to continue to use them.</p> <p>This is not the first advanced weapon system rendered ineffective through Russian EW operations. In testimony to the U.S. Congress, Hudson Institute Senior Fellow Dan Patt listed both the Joint Direct Attack Munitions and Excalibur artillery round as systems whose effectiveness has dramatically diminished. The Excalibur, for example, dropped from 70% to 6% effectiveness “over the matter of a few months as new EW mechanisms came out.”</p> <p>Spoofing is not a new technology area, but it is being employed more frequently in Ukraine as the costs of developing miniaturized spoofing systems have come down. According to Hudson Institute Senior Fellow Bryan Clark, “[one] didn’t really see the advent of miniaturized, capable GPS spoofers until the last ten years or so because you needed the microelectronics to do it.” The challenge for Ukraine and its suppliers is that many of the weapons being provided were designed before this proliferation, opening up previously not-fully understood or explored vulnerabilities.</p> <p>Of course, not all munitions are tied to GPS for navigation or are hardened against these threats, though many of those are more expensive or have longer ranges. The United States has been reluctant to provide weapons systems that could be used to target Russian territory directly.</p> <p>It is not only military systems using GPS navigation that are vulnerable to jamming and spoofing. Earlier in April, published reports indicated that hundreds of passenger jets were affected by an alleged Russian attack on GPS signals starting on Easter Sunday and lasting for 63 hours. Most of the GPS signal attacks took place in Polish airspace, though over 1,600 commercial airlines operating in German, Danish, Latvian, Lithuanian, and Swedish airspace also reported interference. The incident further highlights the vulnerability of GPS in an era in which EW threats are developing and proliferating quickly. Jeffrey Shane, a member of the U.S. National Space-Based Positioning, Navigation, and Timing Advisory Board, observed that “despite a long history of upgrades, GPS has fallen behind . . . given the vulnerability of GPS to interference, the implications for national security are serious.”</p>
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3.2	<p>Directed energy: Taiwan focusing on vehicle mounted laser weapon</p> <p>Taiwan has developed a vehicle mounted directed energy counter-drone weapon to develop a layered approach to defending against a potential threat from People’s Republic of China (PRC) drones. While developed domestically, Taiwan’s program benefitted from input from foreign “friends.” (source and source)</p> <p><i>Assessment:</i> The previous volume of this report highlighted Taiwan’s growing effort to develop capabilities to counter China’s growing drone capability, including the development of a hand-held weapon to jam the navigation signals of incoming drones.</p> <p>In March, media reporting revealed an additional area of Taiwanese counter-drone research focused on the development of a vehicle mounted high-energy laser. The system is similar in concept to Raytheon’s 50-kilowatt laser mounted on U.S. Stryker vehicles that was recently deployed to the Middle East for field testing against small drones in harsh environments. According to comments from a Taiwanese defence official in early March, the National Chungshan Institute of Science and Technology (NCSIST) successfully developed a 50 kilo-watt laser cannon in 2023 with the help of “international friends.” The system is expected to be mounted on CM-32 Clouded Leopard eight-wheeled armoured vehicles and should enter testing in 2024. The official stressed the importance of the technical guidance provided by “countries friendly to Taiwan”, which has allowed Taiwan to advance laser development, progressing from low power to medium power within a relatively short period.</p>
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3.3	<p>Another European 6th generation fighter program? Sweden considers its options</p> <p>SAAB to lead concept study examining options for sixth generation fighter development. (source and source)</p> <p><i>Assessment:</i> In March, SAAB was awarded a contract from the Swedish Defence Material Administration (FMV) to carry out conceptual studies for future fighters for both crewed and uncrewed systems. The announcement comes after Sweden left its role as an observer in the Global Combat Aircraft Program (GCAP) sixth generation fighter development program in 2022. GCAP is led by the United Kingdom, Japan, and Italy and is one of two major sixth generation programs involving European countries alongside the Future Combat Aircraft System (FCAS) program led by Germany, France, and Spain.</p> <p>The contract award is unlikely to signal Sweden’s immediate intent to develop a third, independent program, given the costs associated with developing a sixth-generation fighter. More likely, the contracts will serve as “a journey to figure out what the next steps are” for Sweden, according to Major General Jonas Wikman, Chief of the Swedish Air Force. The goal is to allow Sweden “to have the freedom to decide what suits [Sweden] best and the freedom to invest in capabilities that make sense to” Sweden. Nonetheless, SAAB is a major player in the global fighter market as the designer and manufacturer of the Gripen. As a result, it would be an attractive partner for current sixth generation programs as well as potentially to build a new program with other international Gripen partners.</p>
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4. Digital Communications and Cyber

4.1	<p>We hardly knew thee: The People’s Liberation Army (PLA) disbands the Strategic Support Force (SSF)</p> <p>The PLASSF was established in late 2015 reforms to combine PLA functions related to cyber operations, space, and electronic warfare. (source)</p> <p><i>Assessment:</i> On 19 April, the PLA announced that the SSF was disbanded, and three additional supporting forces would be established in its place: the Aerospace Force, Cyberspace Force, and Information Support Force. The end result of the reforms is that the PLA’s overarching structure will include four services—Army, Navy, Air Force, and Rocket Force—and four supporting forces—the three new forces and the Joint Logistics Support Force.</p> <p>The move came as a surprise to China and PLA watchers. When the PLASSF was originally established, it was viewed as a crucial element of the on-going PLA modernization and as a move that would allow for efficiencies across the closely related areas of space, cyber, electronic, and psychological / information warfare. That the PLA has chosen to restructure these functions by breaking them out suggests the efficiencies gained through organizational consolidation were not significant, or at least not in line with expectations. It also indicates that the PLA is continuing to evaluate and adjust its organizational structure..</p> <p>The three new forces will be responsible for the following areas of responsibility:</p> <ol style="list-style-type: none"> 1. <u>The Information Support Force (ISF)</u>: According to President Xi Jinping, the new ISF will be responsible for “construction and application of the integrated network information system”, ensuring a smooth flow of information, fusion of information resources, and facilitating joint warfare. 2. <u>The Cyberspace Force</u>: The new Cyberspace Force will be responsible for offensive and defensive cyber operations, which are “important for reinforcing national cyber border defence, promptly detecting and countering network intrusions and maintaining national cyber sovereignty and information security”, according to a PLA press release 3. <u>The Aerospace Force</u>: The Aerospace Force will assume responsibility for China’s military space operations, ensuring the capacity to “safely enter, exit and openly use space, enhancing crisis management and the efficacy of comprehensive governance in space and promoting peaceful utilization of space.”
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<p>4.2</p>	<p>Finland to build NATO research facilities for emerging technologies</p> <p>The country will build research centres in Espoo and an accelerator unit in Oulu, Finland’s leading cyber hub, as part of NATO’s Defence Innovation Accelerator for the North Atlantic (DIANA) program (source and source and source)</p> <p><i>Assessment:</i> The centre in Espoo will collaborate with VTT, Finland’s largest technical research centre and the axis for quantum computer development in Finland. It will also test cyber-secure communications in addition to quantum and space technologies.</p> <p>The Oulu site will test 6G network technologies. Finnish Minister of Defence Antti Hakkanen stressed the importance of the accelerators in attracting business opportunities and investment in “new-generation communication technologies and quantum technologies” and establish Finland as “a global frontrunner of dual-use communication technologies”, increasing its ability to contribute to NATO.</p> <p>In addition, on 8 March the Finnish Defence Ministry is working with the Ministry of Transport and Communications to evaluate and reform Finland’s national cybersecurity strategy with the objective of creating an operating model to better protect critical military and civilian assets and infrastructure. Finland has experienced an increase in cyber threats, especially since the start of the Ukraine conflict. As a result, the government has increased funding for cybersecurity to \$350 million in 2024, a rise of 35% since 2023.</p> <p>The initiative will be chaired by National Cyber Security Director Rauli Paananen. The vice-chair will be Director of IT Management Unit Mikko Soikkeli from the Ministry of Defence. According to Paananen, “the government wants to revamp Finland’s cybersecurity strategy in a way that makes it more able to respond to the changed operating environment and the increasing risk to national security that is posed by threats from the cyber domain.”</p> <p>Also on 8 March, the Finnish Ministry of the Interior announced that it would work with the government’s Secretariat of the Security Committee to develop a national security strategy. The strategy seeks to “identify and assess the most serious threats against Finland in more efficient and extensive ways through cooperation across administrative boundaries.” The strategy is scheduled to be published in June 2025.</p>
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5. Human Performance Enhancement

<p>5.1</p>	<p>Combining live, virtual, and constructive and integrating training technologies</p> <p>French company MASA revealed that it had successfully run a battalion level training that integrated its constructive training simulation with a virtual tool that allowed for more fidelity for trainees. The announcement reflects the potential for integration of multiple types of simulation technologies into training exercises. (source – fire walled—and source)</p> <p><i>Assessment:</i> During the IT2EC Conference held in London in April, a representative of simulation and training firm MASA revealed that two French artillery battalions had conducted a force-on-force exercise using the company’s SWORD constructive simulation paired with the Virtual Battlespace (VBS) solution from Bohemia Interactive Simulation, according to reporting from <i>Shephard News</i>.</p> <p>A constructive simulation is essentially a computer program that takes inputs from individual decision-makers in a training environment and simulates the outputs and outcomes of these decisions. SWORD—also known as Soult in the French military—also creates scenarios for trainees to respond to in addition to simulating the impacts of specific decisions.</p> <p>The combination of Soult with VBS added fidelity to the exercise and created a virtuous loop in which the detailed data provided by VBS was used to inform decisions, the impact of which were calculated by Soult and visualised by VBS. For example, VBS was used to simulate uncrewed aerial platforms conducting surveillance, reconnaissance, and target acquisition, providing a video feed of targets populating the Soult scenario (opposing artillery units). This data informed trainee operations planning and decision-making and the results of fire planning missions were calculated by the Soult simulation with subsequent battle damage visualised in VBS.</p> <p>According to the MASA representative, the French Army seeks to include the combined capability in command staff exercises for Brigade headquarters, which would allow for more realistic integration of fires planning.</p>
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6. Computing Power

<p>6.1</p>	<p>French MoD awards five contracts to build quantum computers</p> <p>On 6 March, France’s procurement agency announced it had awarded contracts to five domestic start-ups to develop technologies that will enable the country to build two universal quantum computer prototypes by 2032 with the objective of developing these systems for defence requirements. (source and source)</p> <p><i>Assessment:</i> The contract awards are worth up to €500 million for the five companies: Alice and Bob, C12, Pasqal, Quandela, and Quobly, each of which are considered national leaders in quantum technology development. In a statement revealing the announcement, the Armed Forces Ministry asserted that “quantum technology is of major importance to the Armed Forces, with potential applications in cryptography or in communications. The revolution underway will allow us to perceive our environment with unprecedented precision, discover new materials, explore new ways of transmitting information, navigate where the GPS network is inaccessible.</p> <p>The program—known as PROQCIMA—will be coordinated by the Defence Digital Agency (known as AND in France) in conjunction with the French procurement agency DGA. As currently planned, the program will have two milestones before 2032. Four years into the program, the three most successful projects will be retained to develop the best logic qubits capable of going to scale. After eight years, the competition will then be limited to two companies. These companies will continue to develop their technologies, transitioning from prototype computers, with a goal of 128 logic qubits, to scaled commercial systems, with a goal of 2,048 qubits.</p> <p>On the same day as the announcement of the PROQCIMA program, representatives from several government ministries gathered to discuss the progress France has made in executing the quantum strategy articulated by French President Emmanuel Macron in 2021.</p> <p>Key metrics of progress revealed at the event included:</p> <ul style="list-style-type: none"> • Quantum startups have raised over €350 million to date, making France the leading European country and the third worldwide behind the United States and Canada in terms of fundraising • Over €1.065 billion have been made in public investments • More than 80 quantum projects have been supported
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