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CNA Russia Studies Program

HIGHLIGHTS OF ISSUE 43

- The CEO of ANO "Digital Economy," Evgeniy Kovnir, has recently stepped down from his position, and Dmitry Ter-Stepanov will fill his seat temporarily as acting head of the organization.
- Russia's Seymash Shipyard delivered the Project 09852, special purpose "Belgorod" submarine, the world's largest submarine capable of carrying on board deep-water manned and autonomous submersible vehicles.
- The Russian Ministry of Health plans to launch a new AI platform this year to bring together the medical community and developers to obtain data and apply AI technologies to solve a variety of clinical problems.
- A government decree recently approved federal subsidies to offset up to half of investors' costs on university tech start-ups and related projects.
- According to T-Adviser, on July 1, India successfully completed the first flight of an autonomous technological military drone powered by a Russian NPO Saturn 36MT turbofan engine.

THIS WEEK'S CONTENTS

GOVERNANCE AND LEGISLATION

RUSSIA CONTINUES TO SHOOT FOR TECHNOLOGICAL SOVEREIGNTY

Russia's Presidential Spokesperson Dmitry Peskov recently addressed the issue of Russian technological sovereignty in an interview with RIA Novosti on June 27th. According to Izvestiya, he assured that Russia will achieve its goal of complete technological sovereignty in 10-20 years, with the help of the "Diamond Technology Fund." The concept of a Russian "Diamond Technology Fund" refers to a valuable financial index-based, exchange-traded fund also known as the Dow Jones Diamond Index. Peskov emphasized the importance of Russia's ownership over technological developments. HIs remarks were similar to Putin's statement in late June regarding "the importance for the country of creating its own competitive technologies…that can become new world standards." The Russian leadership's continued goal is to use extensive Western sanctions as a jumping off point for the development of indigenous domestic high-tech industries.

Source: "Before 2030, Russia Will Create a Diamond Fund" [В России до 2030 года могут создать «Алмазный фонд технологий»], Izvestiya, June 27, 2022, https://iz.ru/1355783/2022-06-27/v-rossii-do-2030-goda-mogut-sozdat-almaznyi-fond-tekhnologii.

CHANGE OF LEADERSHIP AT ANO "DIGITAL ECONOMY"

The CEO of ANO "Digital Economy," Evgeniy Kovnir, has recently stepped down from his position. Kovnir, ,CEO since 2017, served as a leader from the start of the organization, originally created to participate in the implementation of the "Digital Economy" program and ensure adherence to its principles and interaction between business, government, and experts. As referenced in the Artificial Intelligence and Autonomy in Russia Report, the "Digital Economy" project is a national program created in 2018that aims to increase domestic expenditure on the digitalization of the economy. The article notes that on May 8, Kovnir was, by order of the government, nominated as a candidate to the Board of Directors of JSC Rusnano.

The founders of the organization have already met to appoint Dmitry Ter-Stepanov as acting head of the organization. Ter-Stepanov has been working for ANO "Digital Economy" since its start in 2017 as Deputy General Director; he focused specifically on data policy and regulation. He began his position as acting head of the organization on July 20, 2022.

Sources: "Evgeniy Kovnir Will Leave His Post as CEO of ANO 'Tsifrovaya ekonomika" [Евгений Ковнир покинет пост гендиректора АНО «Цифровая экономика»], Kommersant, July 1, 2022, https://www.kommersant.ru/doc/5437154; "Dmitry Ter-Stepanov Was Appointed Acting Head of ANO Tsifrovaya ekonomika" [Дмитрия Тер-Степанова назначили врио главы АНО "Цифровая экономика"], Tass.ru, July 7, 2022, https://tass.ru/ekonomika/15157831?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com.

FIRST REGIONAL CODE OF ETHICS FOR AI WAS SIGNED IN NIZHNY NOVGOROD

The first signing of the Code of Ethics in the field of AI by a Russian region took place in late June at a conference in Nizhny Novgorod. The city is home to the school of AI and is considered the "birthplace of Russian AI," making it a symbolic location for the first signing of the Code. Both Deputy Prime Minister of Russia Chernyshenko and Nizhny Novgorod Governor Nikitin were present. There is also a plan to sign a code of AI ethics in Khanty-Mansiysk, Innopolis, and in the Far East. In total, 20 federal departments have confirmed the intention to sign a code of ethics on AI. As discussed in issue 41 of *AI in Russia*, the Code of Ethics on AI, first signed in October 2021, outlines ethical principles and standards of conduct to inform and assist participants in their activities in the field of AI.

Source: "The First Regional Code of Ethics in the Field of AI Was Signed in Nizhny Novgorod" [Первый региональный кодекс этики в сфере ИИ подписали в Нижнем Новгороде], rbc.ru, July 5, 2022, https://nn.rbc.ru/nn/freenews/6299f3689a794721bc31983c.

MINISTRY OF ECONOMIC DEVELOPMENT TRIES TO MODERNIZE NATIONAL PUBLIC ADMINISTRATION

The Ministry of Economic Development is slated to receive 4.8 billion rubles (81,702,124.80 USD) to finance the introduction of digital technology into the public administration field, according to a CNEWS article. There are plans to create a Unified National System for the Development of Regulatory Decisions and a Unified Automated Information System for Supporting Socially Oriented Non-Profit Organizations to introduce a system that can assess quality of public services and use AI to document management tasks for all the above authorities. These specific projects together aim to incorporate digital technology thoroughly in public administration while ensuring control, supervision, and licensing activities within the functions of the Ministry of Economic Development. This goal is also included in the broader federal "Digital Economy" project. More details on the specific projects can be found below.

The Unified National System for the Development and Adoption of Regulatory Decisions in Russia is a system that would form a single national environment for all participants to contribute to the rulemaking of regulatory decisions. The article reported that the system would combine existing interfaces such as the disclosure of draft regulations, the official portal of acts approved by the president, and the database of State Duma bills.

Funds will also go to a Central State University project that is creating a unified mechanism to assess the quality of state and municipal services, process feedback, and propose solutions to state and local authorities. This digital transformation would enhance regulatory regulation and provide Russian citizens with answers to their complaints.

The article acknowledges many challenges that the Ministry of Economic Development faces with this effort, including the lack of tools to monitor the effectiveness of subsidies for federal executive authorities and to analyze state economic sectors and the overall impossibility of building a

modern integrated system based on the combination of several currently functioning information systems. To address these issues, the Ministry of Economic Development created a new State Information System for economics. They aim to develop the system over the next two years. It will cost 294 million rubles but will possibley increase the efficiency of public administration through implementation of a unified policy around digital technologies and government support.

Source: "The Introduction of Digital Technologies in the Russian Public Administration Will Cost 4.8 billion" [Внедрение цифровых технологий в российском госуправлении обойдется в 4,8 миллиарда], cnews.ru, June 17, 2022, https://www.cnews.ru/news/top/2022-06-27_vnedrenie_tsifrovyh_tehnologij.

MILITARY AND SECURITY

RUSSIAN MILITARY CONTINUES USING UAVS IN RECONNAISSANCE STRIKE AND FIRE CONTOURS

In Newsletter 33, we reported on how Russian military forces practiced reconnaissance-fire/reconnaissance-strike contours (complexes) prior to the invasion of Ukraine, a tactic that is key to Russian tactical operations in the country today. These "contours" refer to the grouping of various sensor and strike platforms with integrated information-sharing networks to increase the degree of potential fire capabilities and to reduce the "reconnaissance-destruction" cycle for the timely detection and striking of critical military formations and infrastructure. Russian ISR UAVs are a crucial part in this concept that enables round-the-clock surveillance of targets in real time.

In June and July 2022, Russian forces continued to use Orlan-10—a workhorse of the Russian drone fleet with a range of up to 120 kilometers—in numerous recon fire/strike contours against Ukrainian defenders. To maintain popular support for the war and to demonstrate Russian military achievements in Ukraine, the Russian Ministry of Defense (MOD) regularly published footage and videos from the front. In late June 2022, the MOD published a video of 152-mm Akatsiya self-propelled artillery and Msta-B towed guns crews on the Ukrainian front that coordinated with Russian UAV crews to detect and strike Ukrainian armor and personnel by sharing targeting information. In early July 2022, the MOD released another video showing the 220 mm Uragan multiple launch rocket system (MLRS) conducting strikes with targeting information provided by Orlan-10 UAV crews. The footage highlighted that no more than five minutes pass since the transmission of coordinates from the UAV and the subsequent Uragan strike. In another July 2022 MOD press release, a video featured 120-mm mortar crews firing on Ukrainian positions with reconnaissance provided by UAVs.

Outside the conflict in Ukraine, Russian military units are conducting drills and exercises involving the above-mentioned reconnaissance fire/strike practices prior to deployment. In early July 2022, artillery units from the 58th Army practiced strikes from Msta-S howitzers and Grad MLRSs in the Chechen mountains. During the exercises, about 70 strikes were completed to target adversary

formations. The target coordinates were transmitted in real time from an aerial drone and the Strelets reconnaissance, control and communication system—a tactical sensor-to-shooter information sharing system. Following the above-mentioned strikes in the field and during drills, all artillery, mortar, and MLRS units usually change their firing position to avoid detection by Ukrainian forces.

Prior to the invasion of Ukraine, these tactics were practiced widely across Russian services, and we recorded these drills in our previous newsletters. Today, UAV-provided target reconnaissance and acquisition is a standard practice not just with the Russian but also with Ukrainian forces and their own long-range artillery and rocket forces. Each side in this war is therefore trying to identify, jam, or otherwise destroy the other's UAVs, given the centrality of these systems in current warfare.

Sources: "The Russian Ministry of Defense Showed the Impact of the Akatsiya Self-Propelled Guns and Msta-B Howitzers on the Positions of the Ukrainian Armed Forces" (Минобороны РФ показало удар батарей САУ "Акация" и гаубиц "Мста-Б" по позициям ВСУ), Tass.ru, June 27, 2022 https://tass.ru/armiya-i-opk/15040335; "The Ministry of Defense Showed Footage of MLRS "Uragan" Operations" (Минобороны показало кадры боевой работы расчетов РСЗО "Ураган"), RAI.ru, July 1, 2202. https://ria.ru/20220701/uragan-1799453945.html; " The Russian Ministry of Defense Published Footage of 120-mm Mortar Crews in Ukraine" (Минобороны РФ опубликовало кадры работы расчетов 120-мм минометов на Украине), Tass.ru, July 10, 2022. https://tass.ru/armiya-i-opk/15176727; "Artillerymen in Chechnya Destroyed a Mock Enemy from Msta-S and Grad howitzers" (Артиллеристы в Чечне уничтожили условного противника огнем из гаубиц "Мста-С" и "Градов"), Tass.ru, July 5, 2022. https://tass.ru/armiya-i-opk/15122875.

SHIPBUILDERS DELIVER SPECIAL-PURPOSE SUB THAT CAN CARRY NUCLEAR-POWERED DRONES TO RUSSIAN NAVY

In July 2022, Russia's Sevmash Shipyard delivered the Project 09852 special-purpose "Belgorod" submarine that will carry Poseidon nuclear-powered underwater drones. Belgorod, the world's largest submarine at 184 meters long, is designed for undersea research and maritime search and rescue operations, and can carry on board deep-water manned and autonomous submersible vehicles. During the submarine acceptance ceremony, Russian Navy Commander-in-Chief Nikolay Yevmenov noted that Belgorod will open new opportunities for research and science work for the Russian Navy.

The Project 09852 submarine is the first carrier of Poseidon nuclear-powered underwater drones, or unmanned underwater vehicles. The submarine was initially planned for delivery in 2020. Under Russia's state armament program through 2027, shipbuilders will deliver three special-purpose nuclear-powered submarines to the Russian Navy. The Poseidon nuclear drone that Belgorod is best known for is the subject of much speculation, given Russian government statements that it can travel at high speeds at depths of over 1 km. According to many discussions in the Russian and Western analytical community, Poseidon could be hard to detect, and is apparently designed to deliver a sea-based nuclear strike on shore or naval base targets by causing a radioactive tsunami. We reported on the Poseidon in our "AI and Autonomy in Russia" 2021 report as one of

the potentially AI-enabled and autonomous weapons in the Russian arsenal, although there is little public information available on the drone.

Sources: "Shipbuilders Deliver Special-Purpose Sub with Nuclear-Powered Drones to Russian Navy,"Tass.com, July 8, 2022. https://tass.com/defense/1477527; Edmonds et al., "AI and Autonomy in Russia," CNA.org, May 2021. https://www.cna.org/reports/2021/05/ai-and-autonomy-in-russia; Christopher A. Ford, "Law, Morality, and The Bomb," Arms Control and International Security Papers (Office of the Under Secretary of State for Arms Control and International Security), Volume 11, Number 22, p 9. Nov. 13, 2020.

RUSSIAN DEFENSE SECTOR PLANS TO MANUFACTURE UNMANNED HELICOPTERS

In June 2022, Russia's RIA Novosti daily new service noted that the Russian Helicopters Holding (part of Rostec, the country's largest defense-industrial conglomerate) could manufacturer a 750-kilogram helicopter-type unmanned combat drone. According to sources cited by RIA, this UAV is supposed to be a multifunctional reconnaissance and strike drone that can carry a payload of up to 200 kilograms. This drone can be equipped with a tank version of the Kalashnikov machine gun with 550 rounds of ammunition, 8 unguided rockets, and 16 anti-tank bombs.

RIA cites Denis Fedutinov, one of Russia's top military experts in unmanned aircraft, who noted that this drone would be useful in urban areas, at the frontlines, for improving situational awareness, and even possibly hitting targets at sea. According to Fedutinov, the closest drone competitor to the Russian Helicopters concept is Aeromax's SH-750 UAV, first unveiled during the HeliRussia 2022 exhibition. However, the status of this project, first announced in 2017, is currently unknown.

This proposed helicopter drone is also not the first concept under consideration—last year, the Kronstadt enterprise, the manufacturer of Orion UCAV currently used in Ukraine, announced it will build two helicopter-type UAVs, one with a take-off weight of around 600 kilograms, the other at 1.5 tons. It is likely that these drones will be manufactured at Krosntadt's new factory in Dubna, near Moscow. No further specifications or details are publicly available about these UAVs.

Source: "Russia Will Start Manufacturing Unmanned Combat Helicopters" (В России планируют выпускать беспилотные ударные вертолеты), RIA.ru, June 28, 2022. https://ria.ru/20220628/vertolety-1798596084.html; "Kronstadt" Will Begin Production of Large Unmanned Helicopters" ("Кронштадт" начнет выпуск беспилотных вертолетов большой размерности,) RIA.ru, July 24, 2022. https://ria.ru/20210724/vertolety-1742653436.html.

THE STATE DUMA ADOPTS A BILL ON MEASURES OF STATE SUPPORT FOR THE MOD'S ERA TECHNOPOLIS

The document, adopted by the Duma in June 2022, provides for the creation of a fund for grants and loans to support technopolis participants. The fund will provide technopolis participants with legal, consulting, educational, advertising, information, and other services. The

Russian MOD is granted the right to conclude lease agreements and gratuitous use of property and other agreements, providing for the transfer of the right to use state property located on the ERA territory without holding tenders or auctions. Russian state media noted that Andrey Kartapolov, head of the State Duma Committee on Defense, asserted that more than 100 inventions were created at the ERA so far for the benefit of the Russian Armed Forces.

ERA Technopolis was founded in 2018 by Russian presidential decree to conduct military and joint research with civilian entities on robotics, information security, biotechnical systems, and AI. We wrote in Newsletter 37 about ERA's emerging role as a key AI research and development hub. In April 2022, then-Deputy Prime Minister Yuri Borisov hosted a meeting at the ERA, where an agreement was reached on the ERA's development of AI technologies for the Russian armed forces. ERA often cooperates with the Advanced Research Foundation (Russia's DARPA-like organization) on the development of AI technologies for the nation's military. The Duma bill outlined here would make it easier for the MOD to take possession of technologies and systems developed at the technopolis.

Source: "The State Duma Adopted a Bill on Measures of State Support for Participants in the MOD's ERA Technopolis" (Госдума приняла законопроект о мерах господдержки участников технополиса Минобороны "Эра"), Tass.ru, June 28, 2022. https://tass.ru/ekonomika/15058221.

MARKETS AND PRIVATE SECTOR

ONLINE JOB-SEEKING PLATFORM LAUNCHED

The "SuperJob" employment-search platform has launched the new "Supercourse" educational marketplace. At present, more than 300 courses from leading Russian online schools and training institutes are available in the catalog. Programs cover all disciplines that will help SuperJob users either learn a new profession or update their knowledge and skills and qualify for a higher salary. SuperJob helps partners advertise online courses to more than 14 million monthly users using AI technology that looks for efficiencies in ways to switch jobs that maximize salary gains or future skills usage. After analyzing the user's search query or resume, SuperJob will recommend a useful course so that the job seeker can qualify for a higher salary. The company states that the algorithm is well specified for special fields at a high level of detail. "For example, for a system administrator it will prompt DevOps courses, for a novice iOS developer it will suggest ways to deepen knowledge of Swift, and for an accountant to upgrade to a financial analyst with a salary increase of two times." According to the company, SuperJob already has more than 40 million resumes, more than 1 million new vacancies, more than 150,000 new employers annually and about 13 million users per month.

Source: "Artificial Intelligence Will Select Online Courses for Job Seekers on SuperJob" ["Искусственный интеллект подберет соискателям онлайн-курсы на SuperJob"], CNews, July 8, 2022, https://www.cnews.ru/news/line/2022-07-08_iskusstvennyj_intellekt

NEW MEDICAL PLATFORM ANNOUNCED BY MINISTRY OF HEALTH

The Russian Ministry of Health plans to launch a new AI platform this year that will "bring together the medical community and developers." According to Deputy Minister of Health of the Russian Federation Pavel Pugachev, "this year we are launching an artificial intelligence platform, on which we want to gather the medical community, clinicians who would form clinical tasks for artificial intelligence as accurately as possible." The new platform will

> *"unite clinicians who can say what problem they want to solve using big data, artificial intelligence technologies, and the developers of artificial intelligence themselves with the competencies and skills to obtain data to solve a particular clinical problem. As both our practice and international practice show, the most effective solutions are obtained when they are clearly formulated in an applied way based on the solution of a specific clinical problem. Last year, according to this principle, together with our national medical research centers, data sets were formed for specific clinical problems. And in my opinion, this experience is extremely positive, our task is now to replicate it."*

Source: "The Ministry of Health Will Launch a Platform for Doctors and AI Developers In 2022" ["Минздрав в 2022 году запустит платформу для врачей и разработчиков ИИ"], TASS, July 8, 2022, https://tass.ru/ekonomika/15162903.

CHILDREN'S EDUCATIONAL TECHNOLOGY MARKET EXPANDS

"Robbo," a Russian IT developer in the field of educational robotics and a franchisor of a network of "children's technical circles," is expanding the production of its EdTech product kits for Russian state schools. The company produces turnkey products for hundreds of educational institutions every year. Robbo's investments in the product line amounted to about 500 million rubles, with 200 million rubles spent on starting their own production line directly. According to reports, Robbo "plans to take 65% of the technology market for STEM education in Russia by 2027." The company estimates the total size of this market segment at about 5 billion rubles, which amounts to roughly 20 percent of the revenue of the largest EdTech companies in the country. In public pronouncements, Robbo hopes to grow by an average of 7-10 percent per year.

The entire Robbo product line is built on open technologies. The company's software and hardware does not depend on imports, and access to the products cannot be limited by foreign vendors, which is a key goal for import-substitution compliant companies in Russia. It is suitable for implementation in Russian educational organizations even under sanctions. The founder of Robbo, Pavel Frolov, is quoted as saying that "[w]e produce equipment on state-of-the-art technological lines, which are designed for the technical assembly of robotic kits in large volumes. Already now we can scale production and produce hundreds of thousands of boards monthly. So we are fully prepared to switch Russian schools from foreign STEM technologies to domestic developments." He also noted that, "[i]n the coming years, the domestic IT market will face a serious shortage of personnel. Last year, there was talk of a shortage of between 500,000 and 1

million specialists. It is important to develop the personnel potential of the domestic market, and to do this on import-independent software. We at Robbo were the first in the Russian STEM technology market to switch to open-source software and hardware. This allowed us to quickly adapt to the current economic situation and increase the production of educational technologies, which are now in great need of domestic schools."

Source: "Robbo Expands the Production of Educational Kits for Russian Schools" ["«Роббо» расширяет производство обучающих наборов для школ России"], CNews, July 6, 2022, https://www.cnews.ru/news/line/2022-07-06_robbo_rasshiryaet_proizvodstvo.

NTECHLAB FOUNDERS LEAVE THE FIRM

Aleksandr Kabakov and Artem Kukharenko, co-founders of the important Russian AI firm NTechLab, have left the company. Their departure was made public in July, although it had occurred privately several months prior, according to reports in CNews. NTechLab has had leadership turmoil since 2018, as shareholding stakes have been progressively sold, leaving the company no longer in control of the two original founders. Kabakov and Kukharenko lost their controlling stake in the firm in 2020, when an Emirati investment firm Mubadala and the Russian Direct Investment Fund purchased large minority shares. This followed on a previous purchase by the Ruben Vardanyan Foundation and RT-Business Development, a Rostec subsidiary. The founders lost even their blocking stake in 2021 during a subsequent investment round. Kabakov left earlier in December 2021, followed by Kukharenko, according to CNews. They also report that, "according to data from the Cypriot tax registry, Kabakov's place on the company's board of directors was taken by the head of the planning, analysis, and strategy department of Alfa Capital Management Company, Alexey Panyushkin."

The most famous product of NTechLab is its "FindFace" facial-recognition technology, which, along with the algorithms of VisionLabs and Tevian, is used as part of the multi-vendor video analytics system of the Department of Information Technologies of the Moscow government. In 2021, NtechLab won the US Department of Commerce National Institute of Standards and Technology's Face Recognition Vendor Test in its Face Recognition Algorithms Competition.

Source: "NtechLab Co-Founders Left the Company" ["Сооснователи NtechLab покинули компанию"], CNews, July 6, 2022, https://www.cnews.ru/news/top/2022-07-06_soosnovateli_ntechlab_pokinuli.

NEW AGREEMENTS BETWEEN FIRMS

Two new agreements have been made in recent weeks for better cooperation across the IT and AI sectors. First, the Russian software developer for business process robotization (RPA) PIX Robotics and the developer of the "First Form" business process development (BPM) management system have entered into a partnership agreement. As part of partnerships, the companies plan to implement projects to automate business processes based on the PIX platform.

According to the companies, BPM and RPA technologies complement each other: the former automate management, while the latter automate monotonous tasks and processes. Using a BPM

system in conjunction with RPA provides the most efficient business processes. PIX Robotics and First Form have already implemented a successful RPA implementation to search and collect customer company logistics route tracking information for a London-based fintech company. First Form processes the client's history, including customer relations management systems, financial planning, checklists, communication management, as well as storage and systematization of data received from the websites of cargo carriers.

In the second agreement, the Association of Software Developers (ARPP) "Domestic Software" program and the V.P. Ivannikov Institute of System Programming at the Russian Academy of Sciences (ISP RAS) have signed a memorandum of cooperation "in the field of information technology." The purpose of the memorandum is to develop and strengthen cooperation in the field of information technology, as well as to attract the latest scientific methods and developments to solve the problems of secure software development. According to the agreement, ISP RAS, at the request of ARPP members, will provide access to software analysis tools for their test implementation and provide developers with full technical support when testing practices and code analysis tools on mass-produced software products. ARPP, in turn, will coordinate interaction with vendors and promote the development of secure software development practices.

Sources: "PIX Robotics and First Form Sign Technology Cooperation Agreement" ["PIX Robotics и «Первая форма» подписали соглашение о технологическом сотрудничестве"], CNews, July 8, 2022, https://www.cnews.ru/news/line/2022-07-08_pix_robotics_i_pervaya_forma_podpisali; "ARPP "Domestic Soft" and ISP RAS Signed a Memorandum of Cooperation" ["АРПП «Отечественный софт» и ИСП РАН подписали меморандум о сотрудничестве"], D-Russia.ru, June 27, 2022, https://d-russia.ru/arpp-otechestvennyj-soft-i-isp-ran-podpisali-memorandum-o-sotrudnichestve.html; "Domestic Software Association of ARPP Software Product Developers," TA Adviser, 2022, https://tadviser.com/index.php/Company:Domestic_Software_(ARPP)_Association.

CONSTRUCTION HALTED FOR REGIONAL DATA CENTERS

Rostelecom has stopped construction on several data center projects in the Russian regions because of economic instability and a shortage of imported equipment and materiel. According to the company, it will reorient toward building out further data centers in Moscow and St. Petersburg (the company claims this will include the entire Central Federal District). According to reporting, the company believes that the supply of new data racks will be 30 to 35 percent less than previously predicted, which means that production will no longer meet rising demand for data center colocation services.

This became clear shortly after the onset of the ongoing war with Ukraine. By the end of April 2022, the shortage of sufficient equipment in existing Russian data centers was being reported on. Thus, the number of free racks in the Moscow region in the first quarter of 2022 fell to 800 places, even while prices for colocation services increased by a quarter. At the same time, Moscow and the Moscow region account for up to 72 percent of the entire data center market in Russia. New amendments to the Russian legal framework governing communications infrastructure were

introduced in May to reduce the cost of their burden on the power supply and access to reliable electricity networks. This will be made easier by the focus on key Russian cities, rather than regionally dispersed ones.

The tightness of the supply chain remains a key reason for this freeze on new construction, even if the Russian government is attempting to mitigate the stoppage. According to Evgeny Makaryin, head of the Linxdatacenter Product and Solutions Development Group, "[d]ue to disruption in deliveries, the timing of many objects is now greatly shifted. As new supply chains are being built and tested, it is difficult to reliably predict the timing of large projects."

Igor Dorofeev, the president of the Russian Association of Data Center Industry Participants, noted that, "the situation with engineering equipment is really not very good now, large global companies have stopped their activities. These are all high-power systems: diesel engines from a megawatt and above, powerful chillers. You need to understand that any equipment will not work—you need proven quality." According to the Dorofeev, "Russian analogues exist, but the question remains whether data centers are ready to work on it. Another nuance is that domestic manufacturers have already been seriously loaded in recent months, and their capacities may simply not be enough."

Source: "Rostelecom Stopped the Construction of Data Centers in the Regions" ["«Ростелеком» остановил строительство дата-центров в регионах"], CNews, June 27, 2022, https://www.cnews.ru/news/top/2022-06-27_rostelekom_ostanovil_stroitelstvo.

NEW SYNTHETIC SILICON PRODUCTION SHOWCASED BY ROSTEC

Roselectronics has announced and presented a sample of single-crystal silicon created entirely from Russian materials. According to the company, "the technology will allow import substitution of foreign raw materials in the production of electronic power devices." The technology was developed at NPP Salyut of the Roselectronics holding together with the Institute of Physics of Microstructures of the Russian Academy of Sciences and the Institute of Chemistry of High-Purity Substances of the Russian Academy of Sciences by order of the Russian Ministry of Industry and Trade.

According to Alexander Bushuev, CEO of Salyut Research and Production Enterprise, "Rostec has mastered the technology of its own production from Russian materials of single-crystal silicon with a specific electrical resistance of more than 1000 ohm-cm. Thanks to this, it is possible to completely replace the imports of foreign raw materials that were used to produce silicon wafers for electronic power devices, such as transistors, thermistors, power rectifiers." It is expected that the Russian-produced silicon generation process will be accelerated quickly to plug the current supply gap in electronics resources.

Source: "Rostec Created Silicon From Russian Materials for the Production of Electronic Devices" ["«Ростех» создал кремний из российских материалов для производства электронных приборов"], CNews, July 5, 2022, https://importfree.cnews.ru/news/line/2022-07-05_rosteh_sozdal_kremnij.

THE INNOPROM EXHIBITION SHOWS OFF RUSSIAN-MADE EQUIPMENT

The Innoprom Technology Exhibition in Yekaterinburg displayed several new technologies and finished devices. Prime Minister Mikhail Mishustin attended the exhibition, and his interest in a variety of delayed equipment was widely reported on in Russian media. Mishustin made headlines as well by manipulating a hammer through voice commands to the new A12 robotic arm built by the Eidos-Robotics company.

Among the new items showcased at the Exhibition was the new Gemini quadcopter, produced by Geoscan, which allows for aerial photography. A new machine tool, the Proton T630 by JSC Mekhanika was also displayed. The Proton T630 was developed to be used for high-performance turning and milling of all types of steels and alloys. Finally, the new LADA NIVA Legend 4x4 "Prima" ambulance car was also illustrated. All of these products are designed to be made primarily from Russian components, thus satisfying the new import-substitution thrust of the Russian government. AI and IT technology was also showcased, including the new smart assistants "Charlie" and "Robin," developed by Sensor-Tech, which are designed to aid the blind and deaf.

Sources: "Mishustin Was Shown the Russian Copter, Which Manturov Promised a Year Ago" ["Мишустину показали российский коптер, который год назад пообещал Мантуров"], RIA Novosti, July 4, 2022, https://ria.ru/20220704/kopter-1800108483.html?in=t; "Mishustin at Innoprom Gave Commands to the Robotic Arm" ["Мишустин на "Иннопроме" дал команды роботу-манипулятору"], RIA Novosti, July 4, 2022, https://ria.ru/20220704/innoprom-1800116271.html.

HUMAN CAPITAL

MORE SUBSIDIES FOR INVESTORS IN UNIVERSITY TECH PROJECTS

A government decree recently approved federal subsidies to offset up to half of investors' costs for university tech start-ups and related projects. The federal budget for 2022-2024 provides more than 3.1 billion rubles (52,765,955.60 USD) for these subsidies, as this program falls under the federal project "University Technological Entrepreneurship Platform." This will include projects relevant to students, teachers, and researchers at universities and is intended to improve the quality of life in Russia and sustain its economy with investments in young entrepreneurs.

Source: "The State Compensates Up to Half of Private Investments in Technological Startups of Universities – Resolution" [Государство компенсирует до половины частных инвестиций в технологические стартапы университетов – постановление], d-russia.ru, July 5, 2022, https://d-russia.ru/gosudarstvo-kompensiruet-do-poloviny-chastnyh-investicij-v-tehnologicheskie-startapy-universitetov-postanovlenie.html.

AI HACKATHONS AND EVENTS

There were several developments in AI-related hackathons and training events during this reporting period, the most notable of which are mentioned below:

- The fourth district-level hackathon for the Siberian Federal District was held in Tomsk from July 15–17 as part of the "Digital Breakthrough: Artificial Intelligence" series. Participants were tasked with three case problems: predicting pandemics using AI, creating an AI that automatically verifies mandatory safety requirements of market goods, and helping neural networks determine stress levels using polygraph sensor data. Two new regional competitions recently began: one in Dagestan (July 5–August 3) and another in Orenburg (July 11–August 9). These are a part of the "116 AI hackathons by 2024" series.
- More information about the 2024 "Games of the Future" has been released. According to the website, "The format of the competition will use the latest developments in the field of e-sports, robotics, augmented and virtual reality, information technology and artificial intelligence." It was recently announced that the games will take place in Kazan, and in preparation, Kazan will host a Digital Week in September 2022 as a sort of test run, where a competition featuring four technological sports—soccer, basketball, drone racing, and VR game "Beat Saber" will be held. The 2024 event organizers plan to include at least 16 countries in the games.
- According to a July 2 Tass article, almost 400 Russian students took part in the 7th iteration of the "Big Challenges" competition at the Sirius education center. The three-week program runs until July 24 and includes 13 subject areas ranging from unmanned vehicles, AI, genetics and biomedicine, to cognitive research. The event includes a wide variety of partners such as experts from Lomonsov Moscow State University, National Research Technological University "MISiS," St. Petersburg State Marine Technical University, and research institutes and major companies, including Rosatom, Skolkovo Institute of Science and Technology, Uralchem, All-Russian Institute of Plant Genetic Resources, VTB, Gazprombank, and Aeroflot.
- The 10th International Youth Industrial Forum "Engineers of the Future—2022" was held from June 27 to July 7 in the Tula region. The forum featured 12 different topics of study, including digital design tools, robotics, aerospace, weapons, and modern industrial technologies. More than 200 speakers took part in the event, which was co-organized by the Union of Machine Builders of Russia, the State Corporation Rostec, the Government of the Tula Region, the Federal Agency for Youth Affairs, and the League for Assistance to Defense Enterprises. The event featured support from more than 60 research and industry partners.
- According to a July 8 CNews article, a team of Russian students from the Center for the Development of Robotics in Vladivostok took first place in one of the championships of the International Underwater Robotics MATE ROV Competition hosted by the United States. The team was also awarded first place in three other categories. The finals of the

competition, which was focused on the theme of sustainable development in ocean science, included 61 teams from 15 countries.

Sources: "Digital Breakthrough" [цифровой прорыв], accessed July 15, 2022, https://hacks-ai.ru/; "Chernyshenko: The First Test Competitions of The Games of the Future Will Be Held in Kazan in September" [Чернышенко: первые тестовые соревнования "Игр будущего" пройдут в Казани в сентябре], TASS, July 7, 2022, https://tass.ru/sport/15156129?utm_source=google.com&utm_medium=organic&utm_campaign=google.com&utm_referrer=google.com; "Nearly 400 Schoolchildren Became Participants of the "Big Challenges" Pogram in "Sirius"" [Почти 400 школьников стали участниками программы "Большие вызовы" в "Сириусе"], TASS, July 2, 2022, https://tass.ru/obschestvo/15105345 ; "The Forum "Engineers of the Future - 2022" Will Have 12 Faculties" [На форуме «Инженеры будущего — 2022» будет 12 факультетов], RBC, May 16, 2022, https://companies.rbc.ru/news/8a79cecf-a414-46cc-acaa-d7de2804d7a0/na-forume-inzheneryi-buduschego---2022-budet-12-fakultetov/ ; "Russian Schoolchildren Won the World Championship in Underwater Robotics" [Российские школьники одержали победу на чемпионате мира по подводной робототехнике], CNews, July 8, 2022, https://www.cnews.ru/news/line/2022-07-08_rossijskie_shkolniki_oderzhali.

NEW EDUCATION PROGRAMS AND JOINT RESEARCH AGREEMENTS

Several new education programs and joint research agreements were announced during this reporting period, including the following:

- According to a July 4 CNews article, Moscow's Higher School of Economics has signed a five-year cooperation agreement with Adyghe State University. The agreement details joint research in the field of AI, as well as the creation of joint laboratories. The parties will also organize joint conferences, round tables, seminars, and prepare scientific publications based on the results of joint research.
- According to a June 30 press release, the Chuvash State University will soon offer a new master's program in AI, becoming the first university to offer such training in the Chuvash Republic of Russia. The two-year program will include instruction on natural language processing, machine learning, data mining, and virtual assistants. The new master's program is the real result of a cooperation agreement with Ulyanovsk State Technical University.
- According to a CNews article, VTB bank and the Moscow Institute of Physics and Technology are launching a joint master's program at the Phystech School of Applied Mathematics and Informatics that combines training in AI technologies and methods for solving real managerial and business problems. The program will begin in September, and students will have the opportunity to intern and conduct research at VTB bank during their studies. The educational program consists of three parts—mathematical training and advanced courses in AI and big data, training in management technologies and teamwork, as well as humanities.

- According to a CNews article, the National Nuclear Research University MEPhI is launching Russia's first "quantum engineering" educational program. The bachelor's degree program will be offered by the Institute of Laser and Plasma Technologies. According to the article, the university is offering this course to meet the needs of the "second quantum revolution."

Sources: "HSE and ASU Agreed on Cooperation in the Field of Artificial Intelligence" [НИУ ВШЭ и АГУ договорились о сотрудничестве в сфере искусственного интеллекта], CNews, July 4, 2022, https://www.cnews.ru/news/line/2022-07-04_niu_vshe_i_agu_dogovorilis ; "ChuvGU Will Teach How To Develop AI" [ЧувГУ научит разрабатывать ИИ], Cheboksary.Ru, June 30, 2022, https://www.cheboksary.ru/education/121234_v_chuvgu_budut_uchit_kak_razvivat_iskusstvennyj_intellekt.htm ; "VTB and MIPT Are Recruiting Students for a Master's Program to Train AI Team Leaders" [ВТБ и МФТИ набирают студентов на магистерскую программу по подготовке лидеров ИИ-команд], CNews, June 30, 2022, https://www.cnews.ru/news/line/2022-06-30_vtb_i_mfti_otkryli_nabor ; "The First Educational Program in Quantum Engineering Is Launched in Russia" [Запускается первая в России образовательная программа по квантовому инжинирингу], CNews, June 27, 2022, https://www.cnews.ru/news/line/2022-06-27_zapuskaetsya_pervaya_v_rossii.

THIRTY ADVANCED ENGINEERING SCHOOLS NAMED

According to a CNews article, 30 advanced, university-based engineering schools are to be created in Russia. Prime Minister Mikhail Mishustin recently announced the results of the competitive selection at a meeting of the Russian government, which was published in a D-Russia article. For the topic of "AI and Digital Technologies," the universities are the following:

- Ural Federal University
- Novgorod State University
- Moscow Institute for Physics and Technology
- Tomsk Polytechnic University
- Southern Federal University
- Tomsk State University
- Novosibirsk State University
- St. Petersburg State Marine Polytechnic University
- Perm Polytechnic University
- St. Petersburg Polytechnic University
- and the National Research Technological University "MISiS"

Additional topics include biotechnologies in agriculture, aviation and rocket and space technology, engine building, medical instrumentation, and more. More than 30 billion rubles have been allocated in the budget for the next 2.5 years for the creation of engineering schools. In 2022, high-tech companies plan to invest another 3.6 billion rubles in the project. According to a

D-Russia article, at the moment, more than 40 industrial partners who specialize in information technology, finance, mining, heavy metallurgy, mechanical engineering, and agriculture are participating in the project.

Sources: "An Advanced Engineering School Will Be Created at ITMO" [В ИТМО будет создана передовая инженерная школа], CNews, June 30, 2022, https://www.cnews.ru/news/line/2022-06-30_v_itmo_budet_sozdana_peredovaya; "The List of Universities on the Basis of Which Engineering Schools Will Be Created Has Been Published" [Опубликован список вузов, на базе которых будут созданы инженерные школы], D-Russia, June 30, 2022, https://d-russia.ru/opublikovan-spisok-vuzov-na-baze-kotoryh-budut-sozdany-inzhenernye-shkoly.html.

AI TRAINING PROGRAMS TO TEACH 35 PERCENT OF RUSSIAN CHILDREN

According to a July 8 Tass article, Deputy Prime Minister Dmitry Chernyshenko has announced that Russian AI educational programs in the new academic year will be able to train at least 35 percent of schoolchildren. According to Chernyshenko, training programs are designed for students in grades 3 to 11, and allow children to first get basic and then more in-depth knowledge about AI, including its technologies and areas of application, and to help students decide on the choice of their future profession. In addition, within the framework of the "Artificial Intelligence" federal project of the "Digital Economy" national program, there are plans to improve the quality of Russian AI instructors. More than 15,000 teachers will take training lessons this year. Chernyshenko added that this year, Russian universities will start accepting students for 83 new master's programs in AI.

Source: "AI Training Programs in the New Academic Year Will Be Able to Master at Least 35% of Schoolchildren in the Russian Federation" [Обучающие программы по ИИ в новом учебном году смогут освоить не менее 35% школьников в РФ], Tass, July 8, 2022, https://tass.ru/ekonomika/15163375

RUSSIA CLAIMS IT PERSONNEL ARE RETURNING FROM ABROAD

On July 7, President Putin commented on the flight of IT specialists from Russia, and the national-led efforts (including preferential mortgage rates and military service deferments) that have not fully resolved this issue. He stated: "The fact that [IT specialists] are leaving is not unusual here. Some were scared, some doubted that it would be possible to work here effectively. Some left, and we did not interfere with anyone. Many returned because it is one thing to live in Moscow, St. Petersburg, Saratov, Khanty-Mansiysk, and another thing to live with our neighbors. It's also good there, but it's better at home." On May 27, Prime Minister Mikhail Mishustin announced that about 85 percent of IT specialists who had previously left following Russia's invasion of Ukraine have returned, though these figures cannot be confirmed. On June 20, Maksut Shadayev, minister of Digital Development, Communications and Mass Media said that Russian experts face difficulties in finding employment once they move abroad, so many of them return home.

Sources: "Putin Commented With the Words "Home Is Better" the Departure of IT Specialists to Other Countries" [Путин прокомментировал словами «дома лучше» отъезд IT-специалистов в другие

страны], Izvestiya, July 7, 2022, https://iz.ru/1361350/2022-07-07/putin-prokommentiroval-slovami-doma-luchshe-otezd-it-spetcialistov-v-drugie-strany.

INTERNATIONAL COLLABORATION

INDIA TESTS DRONE WITH RUSSIAN ENGINE

According to T-Adviser, on July 1, India successfully completed the first flight of an autonomous technological military drone powered by a Russian NPO Saturn 36MT turbofan engine. The drone was developed by the Bangalore-based Aeronautical Development Establishment, which is operated by the state-owned Defense Research and Development Organization of India. The test of the drone, which is called the Stealth Wing Flying Testbed, demonstrated its ability to take off, climb, cruise in the air, navigate waypoints, descend, and land autonomously.

Source: "2022: Announcement of a military drone with the Russian engine" [2022: Анонс военного дрона с российским двигателем], T-Adviser, accessed July 17, 2022, https://www.tadviser.ru/index.php/%D0%9F%D1%80%D0%BE%D0%B4%D1%83%D0%BA%D1%82:SWiFT_%28Stealth_Wing_Flying_Testbed%29_%D0%92%D0%BE%D0%B5%D0%BD%D0%BD%D1%8B%D0%B9_%D0%B4%D1%80%D0%BE%D0%BD.

THAILAND-ROBBO JOINT EDUCATION PROGRAM

According to a July 6 CNews article, the Vocational Education Commission of Thailand and the international human development foundation Focus Academy have signed a memorandum of understanding detailing plans to work together with Russian EdTech manufacturer Robbo. The joint cooperation agreement includes provisions for sharing knowledge and academic research about robotics/AI education, promoting the development of educational institutions teaching these disciplines, and forming a talent pool of teachers in the field of high technology. In addition, the memorandum includes provisions for preparing students for international olympiads and robotic programming competitions. According to the article, the Focus Academy plans to supply schools in Thailand with "Robbo classes" using Robbo's sets equipment, software, and classroom materials for teaching about programming, robotics, and 3D modeling. Robbo now exports or cooperates with 27 countries around the world.

Source: "Robbo Will Help Develop Education in Thailand" [Robbo поможет развивать образование в Таиланде], CNews, July 6, 2022, https://www.cnews.ru/news/line/2022-07-05_robbo_pomozhet_razvivat_obrazovanie

EXPANDING BELARUS-RUSSIA AI COOPERATION

At the 9th Forum of Regions of Belarus and Russia, which took place June 31 to July 1, six priority areas for scientific and technological innovative cooperation between the "Union

States" were identified. The six areas are: (1) digital technologies, big data, and AI; (2) new materials and additive technologies; (3) new natural energy sources, including the development of nuclear energy; (4) high-tech medicine, personalized medicine, genetic technologies, and prevention of antibiotic resistance; (5) food security and the development of agriculture and aquaculture, including with the use of genetic technologies; (6) countering man-made, biogenic, sociocultural and cyber threats, and terrorism and ideological extremism. Natalia Bocharova, deputy minister of Science and Higher Education of the Russian Federation said that, "Having determined the main areas of activity, we will now be able to select projects that will correspond to these areas and quickly solve the tasks set for our states."

At the meeting, Bocharova added: "Today, Russia and Belarus find themselves in a situation where, in a very short time, it is necessary to solve the problems of the broken chain of scientific and technological collaboration that existed before with a number of Western countries. We understand that our countries have a set of competencies that, when working together, will give a huge synergistic effect."

Source: "The Development of Science and Education in the Union State Became the Topics of the IX Forum of Regions of Belarus and Russia" [Развитие науки и образования в Союзном государстве стали темами IX Форума регионов Беларуси и России], Ministry of Science and Higher Education of the Russian Federation, July 1, 2022, https://minobrnauki.gov.ru/press-center/news/mezhdunarodnoe-sotrudnichestvo/53545/

RUSSIA-CHINA TECH COOPERATION

According to a July 1 CNews article, Huawei "dramatically increased" the number of salespeople and specialists in its Russian division since 2021. The article states that the number of Russian employees in the first half of 2022 increased by 50 percent compared to the same period in 2021. However, the article notes, there is uncertainty about whether Huawei will continue to operate in Russia given its invasion of Ukraine. While Huawei has not announced such a withdrawal yet, it has stopped deliveries to Russian partners. The article states that many tech experts assume that Huawei will remain on the Russian market in one form or another, even if they have to create a separate brand to continue selling equipment in Russia.

According to a June 29 CNews article, Russian computer technology developer Kraftway has signed an agreement with Chinese company YMTC on the joint production of memory controller microchips in 2023. In two or three years, Kraftway plans to reach a production volume of 1 million solid-state drives per year. According to the article, industry representatives guess that the main customers of this effort will be Russian government agencies. The article notes that the Chinese factory has not yet been specified, and that the Taiwanese factory with which Kraftway previously cooperated stopped working with Russian companies after the start of the "special military operation" in Ukraine in February 2022.

Sources: "Huawei Turns to Face Russia. The Company Sharply Increased Hiring of Employees in the Russian Division" [Huawei поворачивается к России лицом. Компания резко нарастила найм сотрудников в российское подразделение], CNews, July 1, 2022, https://www.cnews.ru/news/top/2022-07-

01_huawei_narashchivaet_chislo_vakansij; "Russian Hardware Developer to Launch Chip Production Jointly with Chinese" [Российский разработчик «железа» запустит производство чипов совместно с китайцами], CNews, June 29, 2022, https://www.cnews.ru/news/top/2022-06-29_rossijskij_razrabotchik_zapustit.

HEAD OF MINISTRY OF DIGITAL DEVELOPMENT SANCTIONED

According to a July 8 CNews article, the head of Russia's Ministry of Digital Development, Maksut Shadayev, has been sanctioned for the first time—by Canada. Canada also sanctioned Tigran Khudaverdyan, who, until recently was chief operating officer of Yandex. This follows European Union sanctions against the head of Roskomnadzor (the Federal Service for Supervision of Communications, Information Technology and Mass Media), Andrey Lipov, as well as four of his deputies in June 2022.

Sources: "The Head of the Ministry of Digital Development Maksut Shadayev Was Sanctioned for the First Time" [Глава Минцифры Максут Шадаев впервые попал под санкции], CNews, July 8, 2022, https://www.cnews.ru/news/top/2022-07-08_glava_mintsifry_maksut_shadaev.

YANDEX WEATHER FORECASTING ENTERS LATIN AMERICAN MARKET

According to a June 29 CNews article, Yandex's "Meteum" machine learning weather forecasting will soon be available in Brazil and Mexico. The article notes that Yandex weather forecasts will be useful in various industries: "aviation, shipping, insurance, retail, construction, agriculture and utilities - the range is huge." Yandex launched Meteum in 2015. According to the article, more than 15 million people use Meteum forecasts daily.

Source: "Yandex Weather Enters the Latin American Market" [«Яндекс погода» вышла на рынок Латинской Америки], CNews, June 29, 2022, https://www.cnews.ru/news/line/2022-06-29_yandeks_pogoda_vyshla_na.

SPOTLIGHT

RUSSIAN MILITARY USES C-UAS RIFLES IN UKRAINE AND DELIBERATES ITS COUNTER-DRONE TACTICS

Aerial drones have emerged as a key weapon in the Ukraine War, used by both Russian and Ukrainian forces for intelligence, surveillance, reconnaissance, target acquisition, and strikes. Many of these drones are commercial models, such as the widely used DJI Mavic varieties. Their ease of use makes them key for forces operating at up to 5 km from each other. With thousands of such drones in the skies over Ukraine, protecting ground forces, soldiers, weapons, and systems has become a top Russian priority in the war.

This is not the first time that Russian forces have encountered commercial drones that were refitted for combat. Starting with its Syria operations, the Russian military recorded a growing number of such drones becoming increasingly potent, penetrating air defenses, and dropping

munitions right on top of targets. The Russian defense industry responded with developing and fielding several counter-UAS (C-UAS) hand-held rifles to deal with such small drones, with the MOD conducting numerous drills and exercises with these and other C-UAS technologies specifically to address the small drone threat. Early on in this war, this technology was strangely absent among Russian forces, especially given the growing frequency of Ukrainian mass-scale use of Mavic and other commercial drone models.

Recently, the Russian MOD released information that its forces have started using two C-UAS rifles. In July 2022, the MOD released evidence of its forces using the Stupor anti-drone gun against Ukrainian drones. Stupor was designed by the MOD's Main Robotics Research and Test Center to target drones in direct line of sight. The rifle emits separate electromagnetic pulses to suppress communication and navigation channels used to operate a drone. As a result, the drone loses contact with its operator, resulting in uncontrolled flight typically ending in an uncontrolled landing. Stupor has a range of 2 km and can be charged from the electric grid or a car battery. Stupor was supposedly tested earlier in Syria with Russian sappers.

Also in July 2022, the MOD stated that Russian forces had used a domestically manufactured LPD-801 C-UAS rifle against small Ukrainian drones. The LPD-801 was developed by the PPSh Laboratory and is capable of jamming UAVs' control channels and navigation signals, blocking Wi-Fi, Bluetooth, GPS, Galileo, and GLONASS signals. According to the manufacturer, it can work in manual and automatic modes. This rifle is shaped like a conventional carbine, with a replaceable battery that can work up to an hour. LPD-801 has a range of up to 1.5 km, and weighs around 3.5 kg, comparable to the mass of a conventional Kalashnikov assault rifle, making it easier to use in combat. The TASS report stated that the LPD-801 can effectively counter Ukrainian drones as many of them are home-made UAVs that were not originally designed for use against serious electronic countermeasures. TASS also noted that United Arab Emirates has apparently purchased a number of LPD-801 rifles.

It is not known how many Stupor or LPD-801 rifles are actually in Ukraine, but given the prevalence of small drones and quadrocopters used by the defending forces, Russian forces probably see a need for a larger number of such tactical, hand-held counter UAS devices at the front. Another C-UAS rifle, REX, made by the Kalashnikov Enterprise, was also advertised in Russia prior to the war, and is likely to be used in Ukraine along with others to counter Ukrainian drone efforts.

Source: "Russian soldier with an LPD-801 C-UAS rifle," Izvestiya, July 9, 2022, https://iz.ru/1362166/2022-07-09/ruzhe-lpd-801-vpervye-ispolzovali-protiv-dronov-vsu.

Countering both small and large UAVs is one of the MOD's top priorities in this war, necessitating a change in tactics and approaches as the conflict enters its fifth month. Although Russia currently fields electronic warfare (EW) and C-UAV systems, it does not apparently provide adequate coverage across the entire front, and such gaps are readily exploited by Ukrainian defenders. To address this problem, Voennaya Mysl (Military Thought) magazine, one of Russia top periodicals for public discussions of military affairs, recently published a proposal for upgraded C-UAV tactics based on what has been learned in Ukraine so far. The authors—military scientists Lt. Gen Eryomin and Col Chyornyi—acknowledged that the experience gained in recent military conflicts like Nagorno-Karabakh and Ukraine indicates both a serious threat to ground forces from reconnaissance and strike UAVs, and the inadequacy of existing approaches to organizing and combating these drones. The authors suggested using new approaches to detect adversary UAVs, the "Single Observer" and "Solid Field" methods.

The authors describe Single Observer as a tactic where, in addition to regular air defense units, other forces are also constantly involved in the reconnaissance of enemy air attacks. The Solid Field advocates for a continuous radar field created in the most probable directions of adversary drone action, such as concentrating radars for reconnaissance of low-flying targets. The article also suggests using additional methods such as "Air Defense-EW Barrier," "Air Defense - Defender of the KVO (Critically Important Object)," and "Air Defense Barrier."

The Air Defense-EW Barrier encompasses complex fire and electronic UAV countermeasures in their most probable operational direction. Defender of the KVO consists of deploying integrated air defense units around critically important objects to target UAVs with anti-aircraft missile systems. Air Defense Barrier involves the use of highly mobile anti-aircraft units that can quickly deploy assets against approaching drones. Voennaya Mysl analysis also proposes the Unified Defense method, which implies a unified intelligence and information support and control for Russian anti-aircraft forces. The authors drive home the point that countering adversary UAVs requires the coordination of forces and systems across the batlefield. Prior the Russian invasion

of Ukraine, the MOD directed multiple EW and C-UAS exercises and drills. Ukraine's successful and mass-scale use of all types of drones to strike Russian forces and positions revealed gaps in these pre-February 2022 tactics that the Voennaya Mysl article seeks to address.

Sources: "Russia Uses Stupor Anti-Drone Guns in Ukraine for First Time — Source," Tass.com, July 6, 2022. https://tass.com/politics/1476173; "LPD-801 Anti-Drone Gun Used Against Ukrainian UAVs" (Против дронов ВСУ впервые применили ружье радиоэлектронной борьбы ЛПД-801), Tass.ru, July 9, 2022. https://tass.ru/armiya-i-opk/15171901; "Media: Special Operation Points to the Need for Improved Anti-Drone Tactics" (СМИ: спецоперация показывает необходимость усиления борьбы с дронами), RIA.ru, July 8, 2022. https://ria.ru/20220708/dron-1801101373.html; Lt.Gen. G.V. Eryomin, Col. S.N. Chyornyi, "The System for Combating Unmanned Aerial Vehicles - A New Technical Level and an Integrated Approach" (Система борьбы с беспилотными летательными аппаратами — новый технический уровень и комплексный подход), Voennaya Mysl, No. 7-22. Pp. 32-40.

This report, the forty-third in a series of biweekly updates, is part of an effort by CNA to provide timely, accurate, and relevant information and analysis of the field of civilian and military artificial intelligence (AI) in Russia and, in particular, how Russia is applying AI to its military capabilities. It relies on Russian-language open-source material.

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