BREAKING DEFENSE

E-BOOK:

PROJECT CONVERGENCE

UNDERWRITTEN BY:

LEONARDO DRS

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Editor's Letter

BREAKING DEFENSE

In 2020, the Army launched its first Project Convergence, a major, months-long series of linked exercises billed as a potentially game-changing vision for the future of the Army. While it's still too early to come to that conclusion, one thing has become clear: in the two years since, Convergence has become the centerpiece of the Army's modernization thinking, a combination of testing grounds, developmental space and training effort.

Held in October and November of this year, PC22 included not only other services, as together they attempted to prove out the ideas underpinning the Pentagon's Joint All Domain Command and Control (JADC2) concept, but also foreign militaries. The latter is key. After all, Pentagon officials constantly remind us that the Defense Department's advantage over near-peer adversaries like China and Russia is its partners and allies, and if that is true, shouldn't those same partners and allies be able to understand and operate with American troops and their futuristic tech? In a truly joint force, an unevenly distributed future is a liability.

In the following collection, you'll read stories from multiple reporters on the Breaking Defense team, covering different angles on PC22, from how the Army has developed its robotic vehicles, to its theory of "disperse or die," to how the service is working to add autonomy to its legacy Black Hawk fleet. It culminates with on-the-ground reporting from Fort Irwin in California, where Army leaders talked us through the biggest challenges — and the potential — of the capabilities tested during this year's exercise.

Project Convergence, the exercise, may be done for 2022. But the topics and ideas that drive it will continue to pop up regularly over the next year, as will coverage at BreakingDefense.com.

Thanks for reading

Aaron Mehta

Editor-in-Chief

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BREAKING DEFENSE

Army's robotic vehicle slipped behind 'enemy' lines in European exercise

A June exercise provided insight into how robots can speed up the pace of battle, and how the US Army, and its allies, needs to plan to defeat them.

The Project Origin robotic combat vehicle is shown during training for U.S. Soldiers assigned to 1st Battalion, 4th Infantry Regiment at the Hohenfels Training Area, Germany, June 6, 2022. (Spc. Christian Carrillo/US Army)

By **ANDREW EVERSDEN**
on August 24, 2022 at 8:52 AM

WASHINGTON — An incoming air assault surprises a fleet of attack helicopters, still waiting on the ground, and sends them scrambling to take off to intercept the inbound force. But suddenly plumes of smoke obscure the airfield, preventing the helicopters from taking off and mounting any kind of defense.

In the ensuing chaos, a key question is left unanswered: Before attack helos got within striking distance, where did the smoke come from?

The answer, at least in the case of an international military exercise in June, was that it came from an "enemy" robotic ground vehicle that managed to sneak behind friendly lines with smoke canisters in tow. The point of the exercise involving the Army's Project Origin autonomy demonstrator at the Joint Multinational Readiness Center in Germany was to hammer home to the US and allies the danger posed by robotic autonomous systems (RAS) and to help the military think about how to fight against them.

"We need to develop a counter-RAS doctrine because our adversaries are doing the same thing," said Maj. Cory Wallace, the robotic combat vehicle requirements lead for the Next Generation Combat Vehicle Cross-Functional Team. "If [the Project Origin team was] able to achieve the level of success that they did at JMRC, it's reasonable to assume that we start figuring out how to defeat these systems."

The Project Origin unmanned ground vehicle, managed by the Ground Vehicle Systems Center (GVSC) out of the Army's Combat Capabilities Development Command, is being used by the service to inform the requirements for its robotic combat vehicle modernization program. The Army's RCV program is among its top 35 modernization priorities. At the end of this month, the platform will take part in an exercise to validate its systems ahead of the upcoming Project Convergence exercise in the fall, according to Todd Willert, program manager for Project Origin.

But beyond informing how the US military should use robotic vehicles, it's also providing harsh lessons in how to defend against them. The idea is particularly relevant given Russia's investment in a robotic combat vehicle, called the Uran-9, which it reportedly planned to complete large-scale testing of this year. What US Army leaders don't want is for a battlefield engagement with a robot to be the first time a coalition force sees one, Willert said.

"You need to make the calculus: Do you attack the platform, which can be replaced? Do you attack the operator, which can't be replaced? Or do you attack the command and control link between the two?" Willert explained. "So we're affording you [allied nations] the opportunity to figure out how you want to attack this emerging problem that's global."

During the event at JMRC, the Project Origin vehicle was integrated into both the rotational force made up of NATO allies and the "opposition" force made up of US troops. The Project Origin vehicle has participated in other operational events in the last year, including integration into the opposing force at Joint Readiness Training Center in November, in addition to fighting alongside Green Berets in Utah in May.

The breadth of payloads the robotic vehicle can carry on the battlefield provides commanders with range of options that they can deploy quicker than the current operations, Wallace said. Traditionally, he said, if a unit wants a particular capability, such as counter-unmanned aerial system, electronic warfare or smoke, they have to request it from higher headquarters and wait. With a robotic vehicle integrated into the formation, the commanders can use those advanced capabilities more quickly, which increases the pace of operations. The robot can also be equipped with a system to launch Javelin missiles, the Common Remotely Operated Weapon Station-Javelin.

Ultimately, the capabilities are "instantaneously available at the point of need," Wallace said.

During the event in Germany, the Project Origin vehicle was used more aggressively than before. In the previous exercises, Willert noted, it simply engaged the forward line of troops. But at JMRC, the vehicle was "skirting around" the forward line and disrupting the command and control elements in the middle of formations, as well as logistics support lines further back from the frontline, such as the forward area refueling point that the unmanned vehicle hit with smoke.

"Each of those have very, very valuable learning points [about] where you can put robotics systems and determining where and how to employ them," Willert said. "And what we found was we were equally effective through each of those areas. And it's something we hadn't done before."

Wallace said part of the vehicle's value is that it "creates multiple dilemmas for the enemy."

"It provides them more problems than they can reasonably solve in a short timeline," he said. "By the time they react to the threat … the force with robotic and autonomous systems have already seized the momentum. They are further ahead in the decision cycle than what the enemy force is trying to react to. That was a substantial learning point from this experiment."

In earlier exercises the force-on-force training exercise at Fort Polk, the robot blocked intersections, denied helicopter landing zones and drove route recon missions. During the experiment with Green Berets, it was used to make initial contact with the enemy.

As the Army and its partners grapple with the outcomes of the JMRC event, Project Origin will continue its work informing the Army's Robotic Combat Vehicle program. Willert said that Project Origin will now prepare for Project Convergence 2022, coming up in the fall. The GVSC team is also completing "hundreds of miles" of autonomy testing, though it will be broken up into several legs.

"We're going to push the limits of the autonomy to see where our warts are and what it is we need to improve," Willert said.

Army accelerating Project Convergence tech with industry 'gateway'

The Army needs to "put a timeline to allow our industry partners to see where our gaps may be, use their technology and their understanding to develop potential solutions and then bring them out," Brig. Gen. Guy Jones, deputy director and chief of staff of Army Futures Command's Futures and Concepts Center, said.

Soldiers assigned to the U.S. Army John F. Kennedy Special Warfare Center and School, who are in the Special Forces Communications Sergeant course, practices using a PDA-184 computer and an AN/ PRC-117G satellite radio during training at the Yarborough Training Complex at Fort Bragg, North Carolina August 29, 2019. (U.S. Army photo by K. Kassens)

By **JASPREET GILL**
on October 11, 2022 at 10:37 AM

AUSA 2022 — The Army will be putting heavy focus on fast-tracking industry tech into operations for this year's Project Convergence sensor-to-shooter campaign, experimenting with what service officials called a "technology gateway" scenario. To judge their effectiveness, the service is also piloting a new "rubric" of rigor.

The Army needs to "put a timeline to allow our industry partners to see where our gaps may be, use their technology and their understanding to develop potential solutions and then bring them out," Brig. Gen. Guy Jones, deputy director and chief of staff of Army Futures Command's Futures and Concepts Center, said at the annual Association of the US Army conference today.

Jones said the new technology gateway scenario is meant to "pull in" industry partners early to understand their technologies and how the service can best integrate them.

According to slides accompanying Jones' remarks, the Army has three goals with the new gateway scenario: integrate industry innovation with ongoing science and technology (S&T) investments; identify emerging capabilities that overcome experimental gaps; and build service-industry collaboration for further experimentation, research and applied S&T.

Maj. Gen. Miles Brown, commander of the Army Combat Capabilities Development Command, said that while looking over the Project Convergence landscape over the last few years, the Army realized there was a need to maintain a "nexus" for industry to enter.

While the gateway is meant to start the conversation early, the Army just in the middle of last month said it conducted science and technology evaluations with 53 technologies, followed by one-on-one engagements with industry partners. Some of those technologies were pushed into two maritime-centric and land-centric experiments, named scenario A and B, respectively. Brown added the Army is piloting a "rubric that puts a sufficient rigor" against those technologies.

"The takeaway from this is we now… have a pilot going for a sprint [Cooperative Research and Development Agreement] CRADA and we'll be able to push CRADAs with our eight centers and labs inside the Combat Capabilities Development Command," Brown said.

Those CRADAs will also be leveraged in other experiments like the annual Network Modernization Experiments, or NetModX, "that will continue to inform in terms of data collection analysis," he added.

The Army also has a list of anticipated outcomes for this year's Project Convergence, including getting recommendations for investing in emerging technologies and divesting programs that don't provide use and establishing a baseline network architecture. This year's experiment also includes the UK and Australia, and the Army wants to develop a resilient mission partner environment that allows allies and partners interoperability, according to PowerPoint slides shown during the panel.

How the Army wants to build its 'wolf pack' drone waves

New autonomy and network technology could enable a new form of high-intensity, low-altitude tactics.

Army drones fly in formation (US Army photo)

By **SYDNEY J. FREEDBERG JR.**
on October 13, 2022 at 1:35 PM

AUSA 2022 — As the Army heads into its annual Project Convergence wargames, the aviation branch is building on earlier experiments with promising new technologies and tactics, officers and officials said during this week's AUSA conference.

This summer's EDGE 22 exercise was the first live flight of drones programmed to use collaborative tactics consciously modeled on a "wolf pack," said Maj. Gen. Walter Rugen, the aviation modernization director at Army Futures Command.

"We demonstrated with multiple, multiple waves of drones that came in [to] see what's out there and report back what we need to go after," said Jeffrey Langhout, director of the Army's Aviation and Missile Center. "Then the next wave comes in, takes care of business. And then another wave comes in and does the assessment and sees if we need to do additional [strikes]."

That cycle — see, strike, re-look, re-strike as needed — is critical, said Rugen: "It's lost on some people we need to assess [and] understand if you've set the conditions" for further maneuver.

In other words, you have to be confident that your waves of deep-scouting, deep-striking drones have successfully blasted a path through the adversary's anti-aircraft defenses. Then and only then do you send assault aircraft — packed with young Americans — to fly behind enemy lines and land ground troops, destroying critical targets and seizing key terrain.

Even with unmanned systems paving the way, however, can manned aircraft really survive the airspace over a high-tech, high-intensity battlefield? Yes, Rugen said — with the right technology, techniques, and tactics.

Russian pilots over Ukraine have showed how not to do this, Rugen argued. "Poor tactics… ill-discipline… flying over the same route at a high altitude during the day, that'll get your jaw busted every time, twice on Sunday," he said. But flying low, fast, and unpredictably, with accurate intelligence provided by drones, US Army aviators can move through the gaps in enemy defenses.

The idea is to exploit the unique nature of what the Army, awkwardly, calls the "lower-tier air domain": the space in between the ground-pounders and the high-fliers, where helicopters fly high enough to zip over obstacles but low enough to take cover behind terrain.

"There's a ton of gaps that we can fight in," Rugen said. That allows Army aviators to fly under the anti-aircraft radars that threaten jets, while maneuvering and striking much faster than ground forces.

"If you do it right, if you set the conditions," Rugen said, "this tempo [of attack] at greater distances, at greater speeds, with greater agility on the edge, is going to break 'em."

Crucial to this kind of combat is some kind of network, able to share orders, updates, and intelligence among widely dispersed, fast-moving aircraft. The aviation branch has experimented with using drones as flying signal relays. Rugen spoke approvingly of a drone called KRAUS and of the long-endurance, solar-powered Zephyr, which stayed aloft for 64 straight days before crashing and, he said, "helped us extend the network [by] hundreds of nautical miles.

"It's MDO-relevant distances," said Rugen, referring to the Army's multi-domain operations doctrine for wide-ranging warfare, particularly in the vast Pacific. "I've been asked if we have a role at INDOPACOM," Rugen said. "We certainly do."

Army 2030: Disperse or die, network and live

Long-range precision strikes are now so deadly that even rear-area support units must spread out and take cover to survive – which puts unprecedented strain on command & control networks.

Army soldiers take cover during a patrol in Iraq (Army photo)

By **SYDNEY J. FREEDBERG JR.**
on October 17, 2022 at 3:25 PM

AUSA 2022 — In an age of drones, commercial satellite imagery and informants wielding smartphones, you have to assume the enemy is always watching, even thousands of miles from the front line.

That surveillance can pinpoint targets for long-range precision weapons, which means rear-echelon command posts, support troops and supply dumps are under threat of attack like never before, a threat that changes how they have to operate. But how do units spread out, take cover, and keep moving — to avoid being spotted, targeted, and struck — while still coordinating any kind of effective action?

That's the tactical dilemma the Army attempts to tackle with its new multi-domain operations doctrine – and the critical technical challenge for its still-in-development battle network.

"We must account for being under constant enemy observation," said Lt. Gen. Milford Beagle, chief of the Fort Leavenworth Combined Arms Center, which put together the all-new edition of Field Manual FM 3-0, Operations. "The battlefield is transparent, and so we have to be dispersed, we have to be more agile."

"Dispersion is critical," Beagle told the annual Association of the United States Army conference, during a panel on the future Army of 2030. "[But] then how do we go from dispersed locations to bring those forces back together to achieve decisive effects?"

Lt. Gen. Milford Beagle (Army photo)

"[Especially] if you're in a theater like INDOPACOM," he said, "you're going to be largely non-contiguous" – with different subunits potentially scattered over multiple small islands, rather than forming a contiguous battle line – "but still, at some point, you're going to have to converge all those capabilities, concentrate all those capabilities, on multiple decisive points."

Thrashing out the tactical and technical complexities is the purpose of the Army-led, multi-service Project Convergence wargames, which this fall include British and Australian troops in both European- and Pacific-inspired scenarios.

Lt. Gen. Richard Ross Coffman (Army photo)

"It's not just the Army,'" said Lt. Gen. Richard Ross Coffman, the deputy chief of Army Futures Command. "This is our joint force, our Five Eyes partners that are there with us…. We will always fight together, and we've got to get our communications, our long-range fires [coordinated]."

"We want to better understand how coalition and joint forces can fight together… so we can either create a new technological solution or use an existing solution," Coffman told a separate AUSA event. "How [do] we map out both message traffic sent from sensors and received by shooters across the joint force?"

Dealing With Dispersion

"Everything is very simple in war," Carl von Clausewitz wrote, "but the simplest thing is difficult." In the two centuries since his time, a new factor has added to the difficulty of the simplest things in war: the imperative to disperse in the face of withering firepower. And as weapons have become more lethal, dispersion has become necessary, not just for frontline fighters, but throughout continent-sized theaters of war.

In the Napoleonic Wars of the early 19th century, Clausewitz fought on battlefields where men stood shoulder-to-shoulder under fire, accepting a greater risk of being hit in order to concentrate their own firepower. In the era of inaccurate, slow-loading muskets, which fired three times a minute and could barely hit a barn beyond a hundred yards, that was a reasonable trade-off. Against the rifled muskets of Solferino and the US Civil War just four decades later, it was a riskier and bloodier approach. Against the machine guns and massed artillery of the First World War, it was suicide.

American soldiers leaving a trench during World War I. (Keystone View Co. via Library of Congress)

So, soldiers spread out, took cover and dug in. When it became clear that a long-enough bombardment could slaughter even troops in trenches, armies largely pulled back out of artillery range, leaving a screening force in the frontline trench while holding most of their men in reserve. In the offense, the German Stosstruppen – translated into English as "stormtroopers" – learned to advance while dispersed, moving forward in small groups to take advantage of every scrap of cover.

But dispersion did not stop there, because weapons — and the systems that found targets for them — became ever longer-ranged and more precise. In World War II, airstrikes ravaged supply columns, reinforcements and infrastructure far beyond the front. In Ukraine and Russia today, kamikaze drones and precision-guided rockets destroy ammo dumps, airfields and civilian infrastructure. In a future war between two high-tech powers – say, the US and China – immense arsenals of long-range precision weapons could strike targets hundreds or thousands of miles away. Space-based surveillance can detect, and cyber warfare can disrupt, operations anywhere in the world.

"Any force that has to fight in 2030 or beyond, we need to be prepared for a very active campaign against the homeland," said Mario Diaz, deputy under secretary of the Army, speaking at AUSA alongside Beagle. "It can contribute to our inability to get what we need from our forts and our ports to the battlefields."

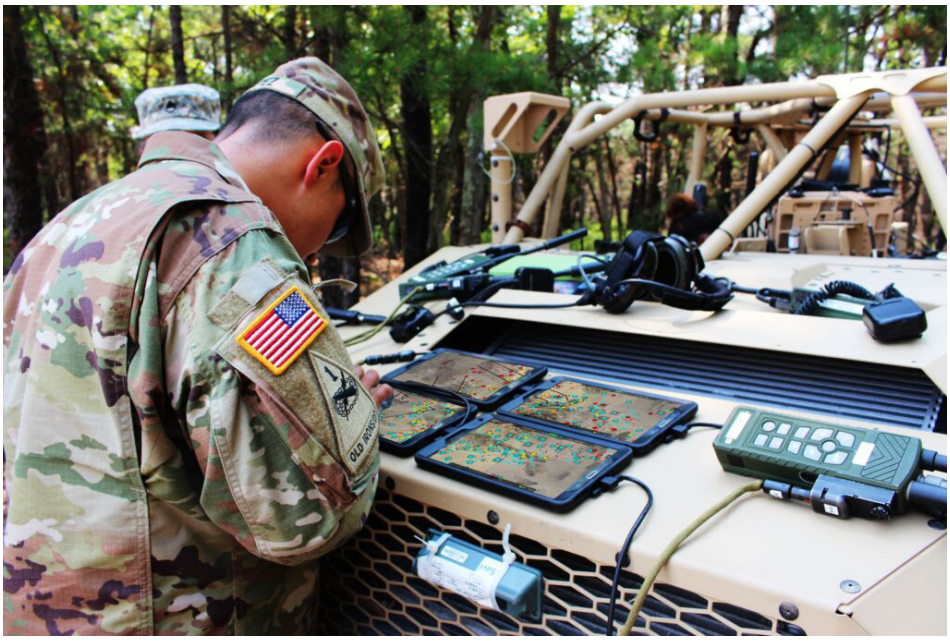
Mario Diaz (via LinkedIn)

The new operations manual warns, "Planners should anticipate adversary forces using all available means to contest the deployment of forces, beginning from home station. […] Leaders must assume they are under constant observation from one or more domains and continuously ensure they are not providing lucrative targets for the enemy to attack."

The new operations manual warns, "Planners should anticipate adversary forces using all available means to contest the deployment of forces, beginning from home station. […] Leaders must assume they are under constant observation from one or more domains and continuously ensure they are not providing lucrative targets for the enemy to attack."

"Forces that are concentrated and static are easy for enemy forces to detect and destroy," the manual emphasizes. "One way Army forces preserve combat power is by maintaining dispersion to the greatest degree possible." Long before they reach the front, it says, units arriving in theater must "disperse elements into company-sized tactical formations while they are performing maintenance checks, loading munitions, ensuring crew readiness, and preparing to move to forward positions."

But spreading out makes it harder to work together. "Although dispersion disrupts enemy targeting efforts, it increases the difficulty of both C2 [command & control] and sustainment for friendly forces," FM 3-0 acknowledges. "Leaders [must] balance the survivability benefits of dispersion with the negative impacts dispersion has on mission effectiveness."


An Army soldier tries out a prototype network device during a 2018 test. (Army photo)

The Network Must Work

This balancing act — the ability to coordinate action despite physical separation — depends on communications. But in the face of sophisticated adversaries, communicating isn't as simple as grabbing a radio, logging into email or picking up a smartphone. Russia routinely jams GPS and communications satellites. Russian troops using cellphones in Ukraine given away their position to Ukrainian artillery, contributing to the deaths of a dozen generals. And even if an adversary can't decrypt a coded radio transmission, they can triangulate its origin to locate the transmitting unit for attack.

"Continuous communication allows enemy forces to detect and target commanders, subordinates, and command posts," FM 3-0 warns. "It should be avoided whenever possible."

Doug Bush (Army photo)

So, the military's next-generation network not only has to transmit masses of data swiftly and securely: It also has to send it in short bursts, without prolonged transmissions that an enemy can trace. That is a tremendous technical challenge the Army will have to solve before it can execute its bold new tactics.

In that context, of the Army's 35 top-priority modernization programs, from hypersonic missiles to augmented-reality goggles, Army officials said one was particularly key:

"I'd mention one and that's the network," said Doug Bush, the Army's civilian chief of acquisition, speaking alongside Coffman at AUSA. "Not everything is dependent on our new network technology, but a lot of it is, and that's a lot of the work that we're doing at Project Convergence — to figure out how to do that network."

"All of those things require people to communicate in a situation when an enemy is trying to take the network down," he added, "so this is graduate-level networking."

Coffman agreed. So did his boss, the four-star chief of Army Future Command, Gen. James Rainey.

"I don't think there's a single thing, but the network would be close," said Rainey, speaking alongside Lt. Gen. Beagle at AUSA. "We believe everything you do is driven by the intel, [so] we've got to have a joint network, at speed and scale, that's compatible with our partners across the joint force.

"It kind of makes it really hard to do any of the other things we visualize if we don't bring that to bear," he said.

The Army's greatest asset here? Not tech, but people. "One of the advantages we have is actually our experience over the last 20 years," said James Greer, a retired Army colonel and former director of the School of Advanced Military Studies.

Gen. James Rainey
(Jose Rodriguez/US Army)

"Our leaders, both non-commissioned and commissioned, have grown up on dispersed battlespace [in Afghanistan and Iraq]," Greer told the AUSA panel. "They have, through their experience, the ability to command and control when they are in fact separated, and they have the ability to bring in joint capabilities in support." The challenge, he said, is "to scale that up."

In the meantime, the Army, as usual, has a backup plan.

"But even… if nobody can talk, in the American Army at least, we're not going to quit," Rainey said. "Somebody will walk until they make contact and close with and destroy the enemy."

At Project Convergence, Army doubles down on 'fully autonomous' Black Hawk experiments

"My requirement was 'don't even bring it if it can't be flown fully autonomous,'" a senior Army Futures Command official said.

DARPA's Aircrew Labor In-Cockpit Automation System program completed the first flight without a pilot onboard an UH-60A Black Hawk helicopter. (Image courtesy of DARPA)

By **ANDREW EVERSDEN**
on October 19, 2022 at 10:38 AM

WASHINGTON — At this year's Project Convergence, the US Army is once again experimenting with its autonomous Black Hawk that could be the future of its venerable Black Hawk fleet — this time without safety pilots and with new payloads.

"My requirement was 'don't even bring it if it can't be flown fully autonomous,'" said Lt. Gen. Thomas Todd, deputy commanding general for acquisition and systems and chief innovation officer at Army Futures Command, told reporters on Monday. "The point being that we have to take a step every year. We have to push ourselves to take steps."

The Army's experiments autonomous Black Hawk program started under a DARPA project called Black Hawk Aircrew Labor In-Cockpit Automation System (ALIAS), in which Black Hawk manufacturer Sikorsky developed a software to fly the bird without an on-board pilot. At last year's Project Convergence, the helicopter flew autonomous, simulated resupply missions with on-board safety pilots.

This year, the Army said it was is looking to continue to mature those capabilities. Maj. Gen. Miles Brown, commanding general of the Army's Combat Capabilities Development Command, told reporters that the Black Hawk is being flown with medical and logistics "packages" at this year's series of experiments, but didn't go into further detail. Todd added that the Black Hawk had flown at "ranges we have not previously seen with payloads we have no previously seen."

The Army views the ALIAS software as a potentially life-saving capability, allowing the service to send pilot-less helicopters into dangerous areas to resupply forward troops or evacuate wounded soldiers. It would also allow helicopters to even take off in bad weather conditions without endangering pilots. The mission sets at Project Convergence will continue to inform the service's leaders about the future of autonomous helicopters after ALIAS's first fully pilot-less flight earlier this year.

"This whole idea of being able to launch an aircraft in all weather, in a contested environment — a high threat environment — and deliver key critical supplies to our soldiers in need is huge for us," Todd said.

As for Sikorsky, the company believes that the ALIAS autonomy software will be a critical component of modernizing the Black Hawk across coming decades.

"We're actually spending quite a bit of our research and development dollars on this to continue to develop this technology to modernize the Black Hawk," said Jay Macklin, director of Sikorsky's Future Vertical Lift business development.

While the Black Hawk is being replaced in the Army's fleet by the Future Long Range Assault Aircraft (FLRAA), the airframe could be around until the 2070s. (Sikorsky is competing against Bell Textron for the FLRAA contract). Macklin said the company is continuing to work with the Army on upgrades to the Black Hawk to ensure that it's equipped with the technology — like sensors and payloads — to ensure that the helicopter fits into the Pentagon's vision of all-domain operations, and integrates into the next-generation of Army rotorcraft.

"The question is how do you make an enduring fleet aircraft capable [enough] to be relevant and be able to operate in that automate operations environment?" Macklin said.

To continue modernizing the Black Hawk fleet, the company will integrate the Improved Turbine Engine onto the bird, giving the aircraft more range and fuel efficiency. The autonomy software will be another critical piece of the upgrades, reducing the burden on pilots as they try to fly the aircraft with the massive amounts of information coming into the cockpit from future sensors.

Macklin said the company is also working to make the Black Hawk compliant with the Army's Modular Open Systems Architecture, which allows the service to easily upgrade aircraft in the future, particularly with systems that will improve aircraft survivability or maintain its connection to the network.

"When the Army briefs the Black Hawk will be around till 2070 and first unit equipped is 2030 for future vertical lift, that's 30-40 years of interoperability," Macklin said. "So we're saying the enduring fleet must be interoperable with future vertical lift."

Breaking Defense's Jaspreet Gill contributed to this report.

As Project Convergence tries new 'tech gateways,' 2 AI algorithms to transition to programs of record

"I would love to say that solving a problem is all that we should be doing at Army Futures Command, but it's not," Lt. Gen. Thomas Todd said. "We really have to be designing the Army of 2040 and beyond. In order to do that, you can't wait on technology in 2040."

Military service members assigned to the 7th Air Support Operations Squadron, Fort Bliss, Texas, and 729th Air Control Squadron, Hill Air Force Base, Utah, conduct warfare operations at the Technical Operation Center-Lite (TOC-L) on Oct. 14, 2022, during Project Convergence 22 experimentation at March Air Reserve Base, California. (U.S. Army photo by Spc. Brenda Salgado)

By **JASPREET GILL**
on October 19, 2022 at 12:06 PM

WASHINGTON — The Army's new "technology gateway" scenario has set the service's Project Convergence tech-focused experiments in "new direction," hoping to follow in the footsteps of two AI algorithms from last year's experiment that will be transitioned into programs of record, according to service officials.

The new "gateway" was added to this year's annual Project Convergence experiments, the Army's contribution to the Pentagon's Joint All Domain Command and Control (JADC2) effort, after the service realized there was a need to start incorporating industry technologies earlier into the experiments.

"This year we're expanding Project Convergence to be a little bit more inclusive of earlier technology… We truly are at the intersection of concepts and technology, and whether it's concepts informing technology or technology informing concepts, we feel like we have an obligation to mature Project Convergence to a point where it not only solves problems, but it gets after opportunities," Lt. Gen. Thomas Todd, deputy commanding general for acquisition and systems and chief innovation officer for Army Futures Command (AFC), told reporters during a call on Monday. "I think that's what expected of our Army, certainly in the modern fight."

As for the specific artificial intelligence algorithms, officials were tight-lipped, except Todd said they were "increment one capabilities" that will be transitioned to programs of record through the gateway. An Army spokesperson later clarified to Breaking Defense that the algorithms were evaluated during last year's Project Convergence. Todd added that AFC is working with the Assistant Secretary of the Army for Acquisition, Logistics and Technology to transition those technologies "in the next fiscal year."

"Without revealing too much, no doubt we'll see these come about in relatively short order," Todd said.

He added the technology gateway experiments, which took place in Yuma Proving Ground, Ariz., will inform existing requirements and things the Army has "not quite frankly thought about." They'll also be incorporated into other Army experiments.

"I would love to say that solving a problem is all that we should be doing at Army Futures Command, but it's not," Todd said. "We really have to be designing the Army of 2040 and beyond. In order to do that, you can't wait on technology in 2040. You have to be designing that technology with the very companies that are doing so."

Other industry partners who took part in the technology gateway included a Lockheed Martin, Sikorsky and DARPA team experimenting with the Black Hawk Aircrew Labor In-Cockpit Automation System (ALIAS), BlueHalo's HIVE offensive swarm architecture and advanced waveform networking from Collins Aerospace, according to a list of industry technologies provided to reporters.

Maj. Gen. Miles Brown, commanding general of US Army Combat Capabilities Development Command (DEVCOM), told reporters the technology gateway was a "new direction" for Project Convergence and involved a rigorous process of looking at the "technical merit" of the technologies provided by the companies.

During the annual Association of the United States Army conference on Oct. 11, Brig. Gen. Guy Jones, deputy director and chief of staff of AFC, said the technology gateway scenario was meant to "pull in" industry partners early to understand their technologies and how the service can best integrate them.

The Army needs to "put a timeline to allow our industry partners to see where our gaps may be, use their technology and their understanding to develop potential solutions and bring them out," Jones said then.

How Project Convergence is informing British, Australian military modernization

Officials from both the United Kingdom and Australia took part in this year's experiment for the first time, bringing their own technologies alongside the US Army to test across the past few months.

U.S. Soldiers, assigned to 82nd Airborne 3rd Brigade Combat Team, train with the Integrated Visual Augmentation System as a part of Project Convergence 2022 (PC22) at Camp Talega, California, Oct. 11, 2022. During PC22 many systems will be tested to determine how future command and control capabilities can be integrated with all-service multi-national partners (U.S. Army photo by Sgt. Thiem Huynh)

By **JASPREET GILL**
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FT. IRWIN, Cali. — The British and Australian military are taking notes from this year's Project Convergence to see how their own programs and soldiers can benefit from the annual sensor-to-shooter experiments, meant to build out the Pentagon's broader Joint All Domain Command and Control (JADC2) effort.

"Warfighting in the future is going to require collaboration, we're going to need to collaborate across countries, but also across domains and across technology," Alex Chalk, UK's minister for defence procurement, told reporters Wednesday. "This is all about making that happen."

Officials from both the United Kingdom and Australia took part in this year's experiment for the first time, bringing their own technologies alongside the US Army to test across the past few months. The British Army brought over 450 soldiers and 20 scientists and engineers from its Defence Science and Technology Laboratory, while 110 Australian soldiers took part in the experiments.

At Ft. Irwin, Cali., during "scenario bravo" of Project Convergence, several technologies from the UK and Australia were tested, including tactical unmanned aerial vehicles, robotic autonomous vehicles, drones and network-focused technologies.

According to a handout given to reporters at the scenario bravo demonstration and a press release from the UK government, the following technologies from the British and Australian military were tested (not all of the technologies were listed):

- ☐ Watchkeeper – A tactical UAV that features a "dual payload, all-weather operation" with de-icing and automatic take-off and landing capability. (UK)
- ☐ Zodiac – An artificial intelligence system that was connected to the US Army's own sensors that fed data into a "multinational intelligence network." (UK)
- ☐ G-AMB (Giraffe) – An air surveillance radar that was connected to a US network to monitor targets. (UK)
- ☐ UK HoloLens – Augmented reality lenses used to support logisticians and maintainers. (UK)
- ☐ Robotic autonomous vehicle platoon – A team of vehicles that performed surveillance and targeting missions. (UK)
- ☐ Integrator extended range UAS – Provided intelligence, surveillance, reconnaissance and electronic warfare effects to commanders. (AUS)
- ☐ Trapnet – A system that automates the creation of decoy tactical networks. (AUS)
- ☐ Group II collaborative drone swarm – Drones enabled with AI software that deliver targeted data to FIRESTORM, a "tactical AI brain" which was tested during previous Project Convergence experiments. (AUS)

Maj. Gen. Sharon Nesmith, deputy chief of the UK general staff, told reporters the experiments served as a "brilliant demonstration of how the British Army is seeking to modernize," specifically when it comes to Future Soldier, the UK's program to develop its Army of the future that Nesmith called the "most significant transformation program" of the last few decades.

"And of course, modernization is at the heart of that transformation program," she said. "And if we want to be more nimble, agile, and more expeditionary, we need to be able to test ourselves and inform that modernization program. So what we've taken from Project Convergence is a fantastic opportunity to do that alongside our partners and our allies. We learn from each other, we share our thinking, we'll be better for it, you know, we'll be better for it today and better for it tomorrow when we have to fight alongside each other."

Australian Army Brig. Gen. Warren Gould, director of general systems and integration, added that one of the most successful missions he saw during scenario bravo was a demonstration that involved relaying targeting information from US sensors to Australia.

"And doing that electronically for the first time, with humans in the loop, but providing that information flow all the way into Australia, that led to a live fire mission in Australia, which was an outstanding first for us," Gould said.

At Project Convergence, data management is Army's biggest challenge

"A few years ago, we wouldn't have had that problem because we wouldn't have been talking to each other and our machines certainly wouldn't have been talking to each other," said Air Force Lt. Gen. Clint Hinote." And so that's a huge step forward is the fact that we are all sharing data right now, it's almost too much."

U.S. Soldiers assigned to 2nd Battalion, 20th Field Artillery Regiment, work with the Autonomous Multi-Domain Launcher (AML), on a Palletized Load System (PLS) using a Remote Interface Unit (RIU) as a part of Project Convergence 22 at Fort Irwin, California, Oct. 31, 2022. (U.S. Army /Collin S. MacKown)

By **JASPREET GILL**
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FT. IRWIN, Cali. — In the past, Army leaders have lamented the lack of data on hand and the inability for what information they had to break across stovepipes. Which makes the big finding out of this year's Project Convergence experiments an ironic one: the service, officials say, now has too much data to work with. And now Army leadership has to figure out how to better manage it before they drown.

Speaking to reporters Nov. 9 at the "Scenario Bravo" demonstration of Project Convergence, an annual experiment meant to build out the Pentagon's broader Joint All Domain Command and Control (JADC2) effort, Army Secretary Christine Wormuth said "the problem is not a lack of data, you know, we're now able to tap into a huge volume of data."

"So a lot of the challenge is going to be figuring out how…we process that as quickly as we can," she continued. "And I think we did see some real…improvements in terms of how quickly we were able to take information and change it into sort of what I would call more actionable knowledge."

Wormuth, who has made turning the Army into a data-centric service a top priority, added that she thinks the service can get additional "top down sort of guidance" from the the Office of the Secretary of Defense on how to better standardize data so it's accessible and shareable across platforms and services, an area that was also highlighted during last year's experiments.

Along with standardizing data, training commanders to understand the data and not be overwhelmed will be just as important, according to Wormuth.

It's not just the Army: managing data proved to be an issue across the board for other military services and international partners who took part in this year's Convergence exercise. Lt. Gen. Clint Hinote, Air Force deputy chief of staff for strategy, integration and requirements, told reporters that he saw "real progress" this year, but there were still issues.

"I'll start with one of the big problems we identified in this particular scenario, one of the challenges, is going to be [that] we have too much data and we haven't been able to correlate and fuse it in the way that we want to to provide it to the warfighter," Hinote said. "A few years ago, we wouldn't have had that problem because we wouldn't have been talking to each other and our machines certainly wouldn't have been talking to each other. And so that's a huge step forward is the fact that we are all sharing data right now, it's almost too much."

Speaking with reporters earlier that day, Lt. Gen. Charles Hamilton, Army deputy chief of staff (G-4), said he wants more than just situational awareness with the data — he wants the data to drive a decision at echelon from the tactical point of contact back to the strategic support area.

"So that was one of the big things that we wanted to get out of this and… it challenged us to look through and work through all that data we're looking at, to help us not only inform something happened in the past, that's great, but helping you make the decision for the future that can make sure we maintain that momentum of the maneuver," he said.

Hamilton, who in his role coordinates logistics policy, said the experiments conducted this year that involved artificial intelligence and machine learning could help in future missions, particularly when it comes to giving options to a commander.

"Because what's going to happen in the future is that at some point, that machine is going to be so intuitive, it's not going to make a decision, but it's going to have the ability to wake me up at two in the morning, and say, we have 20 aircraft on the ground and Scott Air Force Base," he said. "It has a routine conveyor belt shipment of food going into theaters. It's going to say, Charles, you got three options…you can down load those 20 aircraft in about five hours…[or] it could say, I'm gonna do a hybrid, I can offload only 10 and put 10…But through machine learning and artificial intelligence is going to give you those options."

That's a big difference from how that process is done now, according to Hamilton, who said he'd have to have at least three or four meetings to get to a decision.

"That's not fast," he said. " We've got to be that fast and that good."