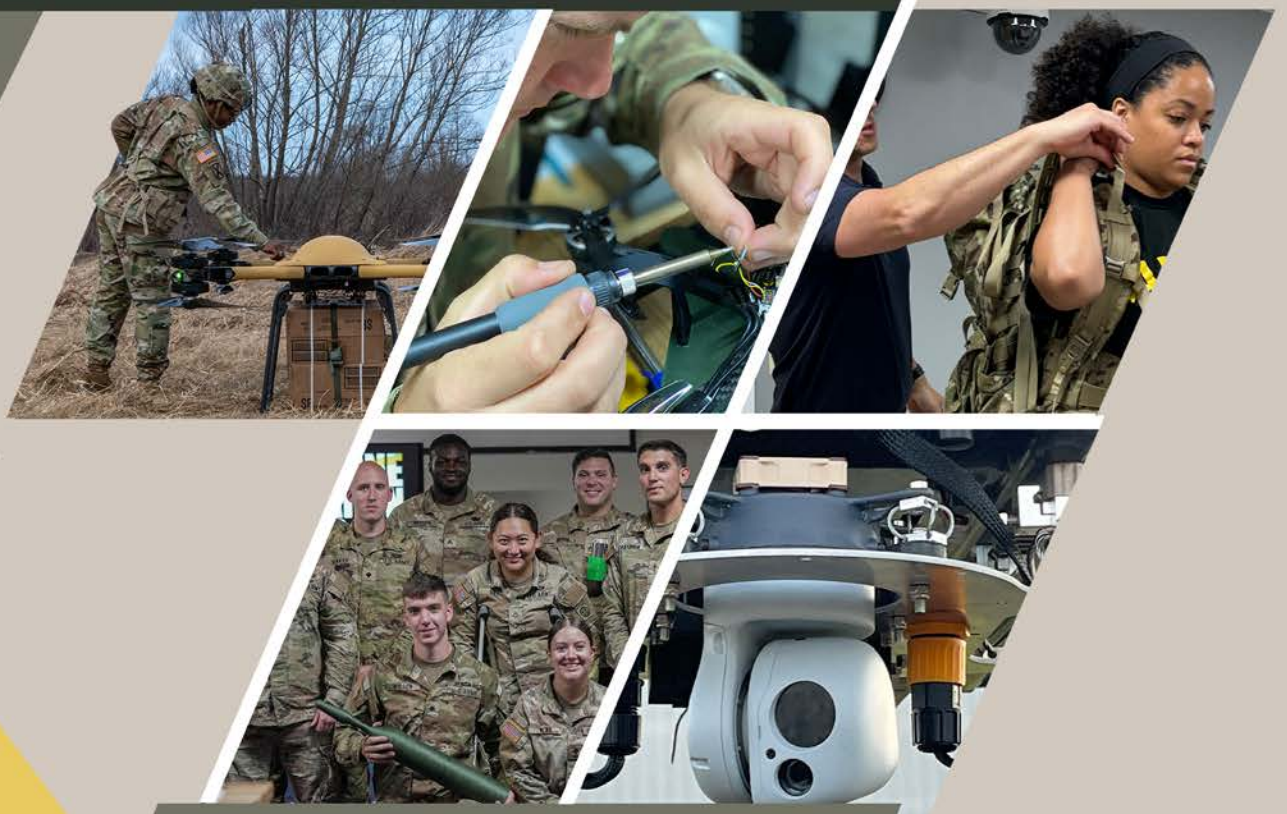
U.S. ARMY

CATALYST | PATHFINDER | ACCELERATING FORCE

YEAR IN REVIEW



2024

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DEVCOM ARMY RESEARCH LABORATORY

DEVCOM ARMAMENTS CENTER

CIVIL~MILITARY INNOVATION INSTITUTE

ACME GENERAL CORP

Year in Review 2024

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Image courtesy of CMI2.

Concept to Conversion

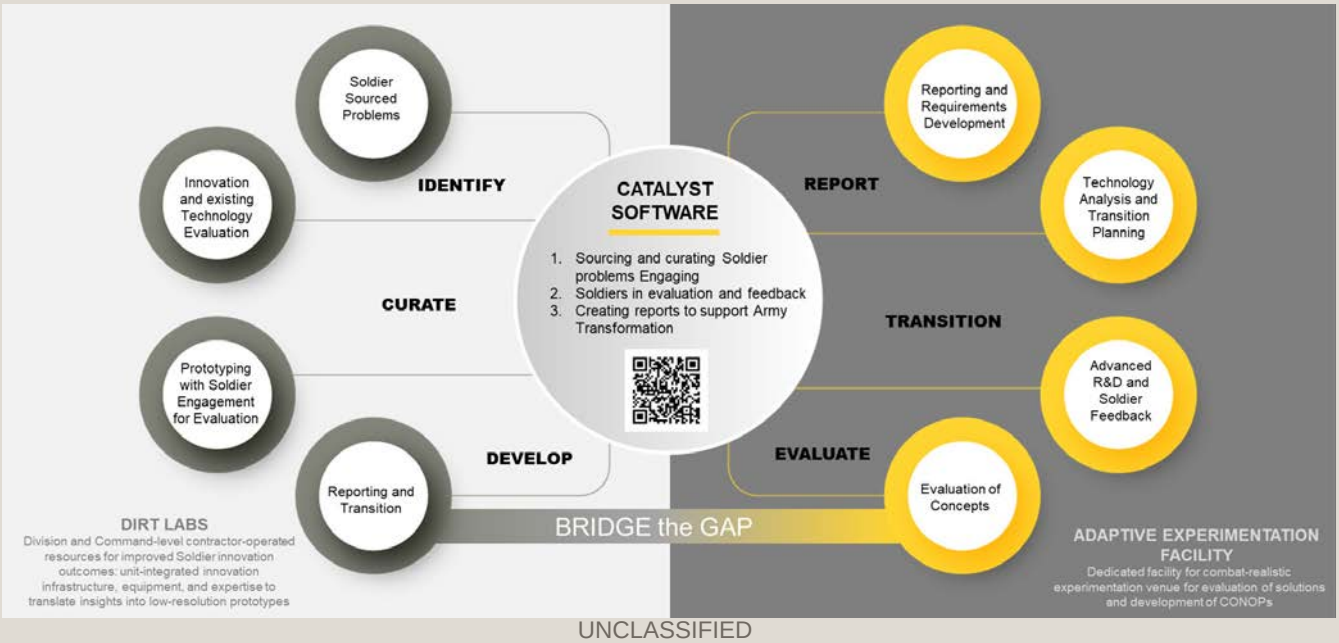
The U.S. Army Futures Command (AFC) continues its work toward advancing the Army modernization strategy with one focus – to enable Soldiers and units to win our nation's wars and return safely home from multi-domain operations.

Multiple years into the development of an experimental methodology and collaboration between the U.S. Combat Capabilities Development Command (DEVCOM), Civil-Military Innovation Institute (CMI2), and Acme General Corporation Inc., evidence notes a tangible impact on the challenges that once stymied innovation, with novel ideas transitioning from concept through conversion. This experimental methodology is the core output of the Catalyst Pathfinder and the Accelerating Future Operational Requirements, Capabilities, and Experimentation (FORCE) programs.

The original concept was focused on creating a model for deliberate transformation: an opportunity to develop Soldier-driven, tactical innovation capabilities by helping Soldiers connect and partner with the critical science and technology ecosystem in academia, industry, and government to bridge the defense innovation gap.

Given the Army's need for advanced science and technology to drive those future capabilities, the Catalyst Pathfinder program was built on the hypothesis that researchers could more effectively develop solutions to emerging operational needs via engagement and collaboration with Soldiers or end-users. Further, the Accelerating FORCE program focuses on accelerating emerging technologies from academia and small businesses to more rapidly address emerging operational needs.

The enduring outcomes from these efforts have been three-fold – 1) the growth and transformation of the network (academia and industry) to support Army modernization, 2) the refined movement of technology to the program offices that have accelerated the technology transition cycle, and 3) the creation of a collaborative and highly focused prototyping process between Soldiers, academia/industry, and government and institutionalizing the lessons learned from the process. These three outcomes align directly with the spectrum of Army experimentation from Concept-Driven Experimentation to Transformation in Contact ethos of the U.S. Army, by solving problems and accelerating opportunities to rapidly transition innovative capabilities in formations in 24 months or less.



CATALYST captures Army unit-defined problems and feedback from Warfighters to enable research partners to develop solutions through the Soldier Innovation Platform and create tools to interface researchers with Soldiers from project identification through transition.

PATHFINDER collaborates directly with Soldiers to curate Army-identified problems and integrate partners (academic partners/industry/government) for execution and transition.

ACCELERATING FORCE identifies and analyzes essential U.S. Army requirements and modernization gaps and interjects emerging technologies to help fill those gaps and compress the technology transition timeline.

Today, these programs are crucial in enhancing the Army's capacity to adapt to rapidly changing operational environments.They improve decision-making and help integrate advanced technologies by utilizing feedback to inform the Army about the technologies and configurations its future forces may require.

Together, these programs work to create the following:

> an integrated, one-team approach to addressing technology problems via a methodology that capitalizes on user-derived insights to better align university- and small business-based science and technology research with real-world Soldier feedback,
>
> a process to enhance the ability to connect research to user needs,
>
> a bridge from emerging scientific advancements to mature technologies that can transition to a permanent program and sustainable commercial markets, and a robust analytical framework to enhance military innovation and the delivery of commercial solutions to the U.S. Department of Defense (DOD),
>
> a robust analytical framework to enhance military innovation and the delivery of commercial solutions to the DOD.

While independent and essential as stand-alone programs, the connectivity between Catalyst Pathfinder and Accelerating FORCE finds an opportunity where, ultimately, project transition informs requirements, and projects are transitioned to industry or other government programs to continue the development process to further benefit Soldiers across the Army.

These programs identify and expedite Soldier-driven, tactical solutions by addressing real-world military challenges and fostering technology commercialization with a synergistic program focusing on transition. Once solutions are identified and developed, the goal is for state-of-the-art technology to transition into novel, accessible capabilities for the end-user or Soldier, to ensure a practical state of readiness and accelerated performance.

31

CATALYST: Total Soldier Innovation Platform Tenants

54

PATHFINDER: Total Projects (Seed/pilot combined)

4

ACCELERATING FORCE 4 for 4 Technology Transitions Shaping Programs of Record

Problem Identification
Soldier sourced problems

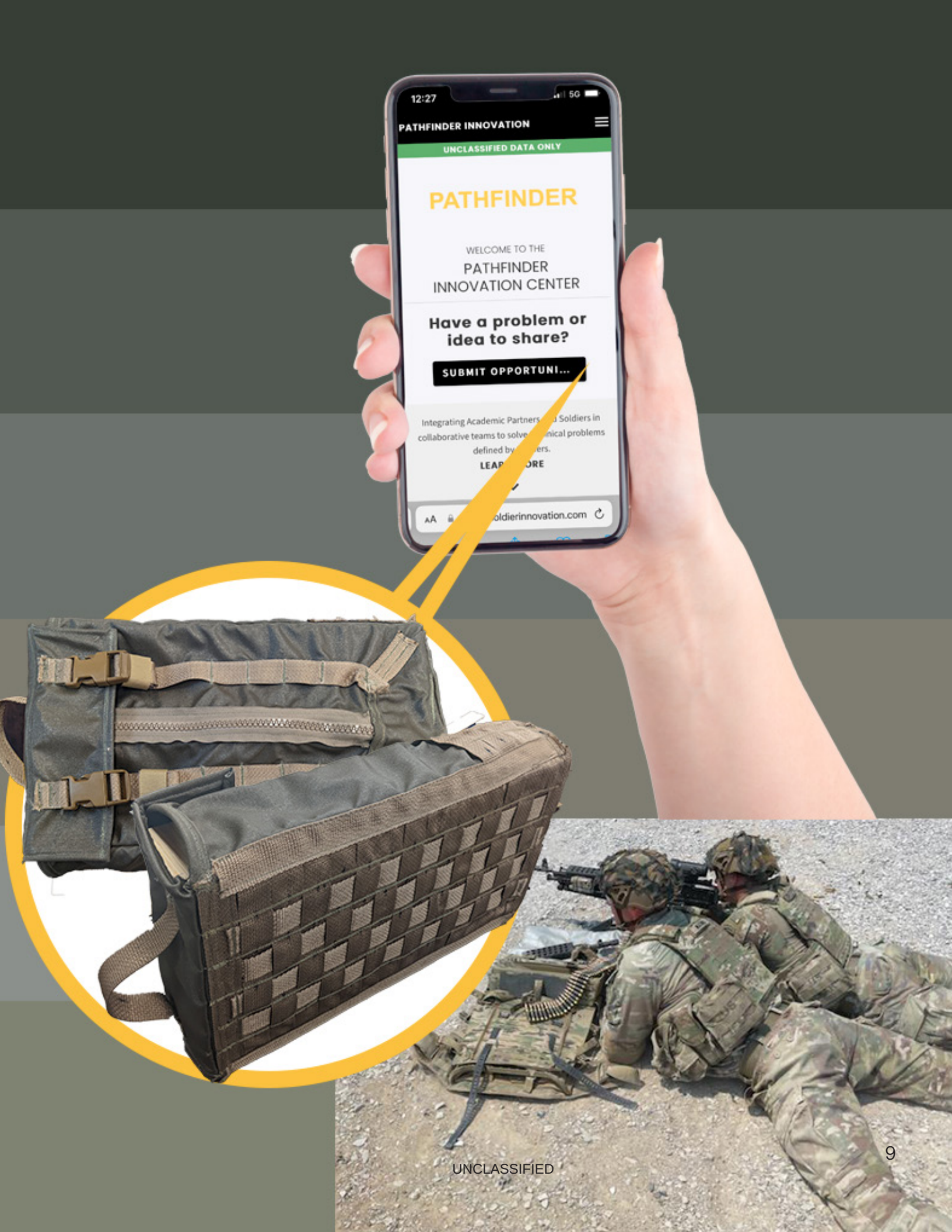
Analysis
Existing technology evaluation

Solutions
Prototyping innovation with Soldier engagement for evaluation

Experimentation
Field experimentation and hands-on excercises to validate prototype solutions

Technology Transition and Transfer Technology
Analysis and transition planning

Reporting
Documenting findings to inform investment decisions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Ensure Soldier-Identified Opportunities become Solutions for Innovation

The Army's commitment to advancing its capabilities is reflected in its efforts to connect frontline Soldiers and researchers, fostering continuous transformation and tactical innovation, thus enabling swift responses to dynamic operational needs. By integrating insights from the field with cutting-edge research, the Army can maintain its tactical edge and ensure that innovations are grounded in real-world experiences.

The Soldier Innovation Platform provides a critical component to meeting the needs of Army Soldiers by capturing Soldier-identified opportunities and linking to a community to offer new technological solutions to those needs. By facilitating direct dialogue between those who face challenges on the battlefield and those who can develop solutions, these hubs enhance the overall effectiveness of military operations.

Operational feedback is vital for accelerated transition and transformation in contact for any tactical innovation. Capturing and analyzing input from Soldiers regarding the functionality and effectiveness of developed solutions allows the Army to refine its approaches and technologies more rapidly. This continuous loop of feedback and improvement not only enhances the adaptability of the Army's innovations, but also ensures that they are well-suited to meet the evolving demands of the battlefield.

The evolution of the Soldier Innovation Platform is ongoing and new features are regularly being advanced for users. Some of the most exciting new capabilities and updates implemented in FY24 were:

> Development of a reporting and analysis dashboard for Soldier Innovation Platform to allow for streamlined analysis of innovation opportunities and projects across all levels of the force,
>
> Development of advanced data analytics capabilities for data aggregation across tenants, user-controlled data privacy settings, and alignment of innovation opportunities to Warfighting functions, and
>
> Development of robust data visualization tools for input and feedback collected through the Soldier Engagement Platform to be operationalized by DEVCOM personnel and Innovation Officers.

Catalyst - By the Numbers

31

Soldier Innovation Platform Unit Tenants

7

Soldier Engagement Platform Tenants

12

New Soldier Innovation Platform Unit Tenants

4

New Soldier Engagement Platform Tenants

1,067

Total Submissions

877

Total Unique Submitters

495

New Submissions (FY24)

411

Total Unique Submitters (FY24)

Transforming Soldier Ideas into Innovation

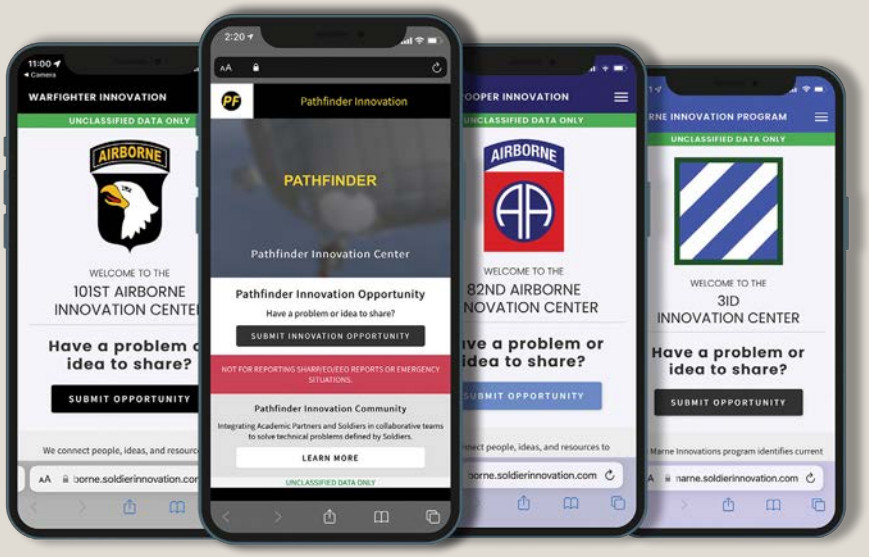
By addressing real-world military challenges and fostering technology commercialization, the Army's Pathfinder program integrates researchers and Soldiers in collaborative teams to solve technical problems defined by Army units. The program helps to identify and expedite solutions for the Army needs through continuous feedback, iterative development, and rapid prototyping, starting with the end-users the Soldiers.

Initially developed in FY21, the Pathfinder program implemented the Pathfinder methodology to (1) implement a scalable methodology that capitalizes on Soldier insights to better align university-based science and technology programs with end-user requirements, (2) create a process that informs academia, small business, and government researchers on continuous, emerging Army needs and enhances the Army's ability to connect research to Soldier needs, and (3) establish an integrated, reciprocal, interdependent team-based approach incorporating end-users, researchers, and transition stakeholders to address technological opportunities and challenges. The Pathfinder methodology was the foundation for guiding tactical innovation.

The Pathfinder methodology utilizes a translational research approach to keep end-users (Soldiers) engaged throughout the research process to influence academia and commercial industry partnerships for maximum effectiveness. The methodology consists of the following five phases (1) Problem Identification, (2) Problem Curation and Solution Research, (3) Performer Research and Selection, (4) Solution Development, and (5) Solution Delivery and transition.
Historically, our nation's research universities have served as a source of disruptive science and technology critical for American institutions' competitiveness.

In just four years, the initial departure from traditional research grant and academic funding models to direct engagement with Warfighter input and collaboration has significantly impacted the concept of transformation in contact as its foundation. Thus far, Army Units in 16 states and two countries are currently engaged partners in tactical innovation via the Catalyst Pathfinder program.

In doing so, the impact on Soldier-driven, tactical innovation is seen in the development of modern, user-centric designs that deliver value to Warfighters through a strategic and strengthened engagement with research performers that benefit national security.



The Pathfinder program funds projects with universities and small businesses that directly address prioritized unit needs. The following section (Pathfinder Project Highlights) lists some funded projects to demonstrate the portfolio of work.

FY24 Pathfinder Numbers

54
Total FY24 Funded Projects

9
New Industry Projects

29
Engaged Command, Corps, and Divisions

21
University Projects

33
Academic and Small Business Partners

U.S. Army National Guard photo by Edwin L. Wriston

Pathfinder Project Highlights

Reconnaissance Reporting Distributed Drone (R2D2)

Goal: Develop an autonomous Uncrewed Aerial Systems (UAS) solution driven by Artificial Intelligence/Machine Learning (AI/ML) logic capable of executing a mission without operator intervention or control after the mission has launched.

Challenge: U.S. Army Central Command (CENTCOM) Soldiers are exposed to counter-detection technologies while operating UAS supporting Intelligence Surveillance and Reconnaissance (ISR) missions. UAS operators are vulnerable to enemy counter detection for the mission's duration.

Success Summary: The pilot project started on 31 May 2024. During the pilot, a novel capability for autonomous flight dynamically adjusting according to AI-enabled anomaly detection, collecting and processing critical ISR data in real-time was demonstrated.

What's Next: With critical advancements demonstrated during the Pilot Project, the Catalyst Pathfinder program is working with critical stakeholders to shape requirements based off outcomes of the pilot, guide operational test and evaluation towards the stated need, and seeking transition partners to expand development into more realistic operational environments.

Partners: Survice, Reveal Technology, ThinkDeeply

R2D2 mounted to the Tactical Resupply Vehicle (TRV)-150C for testing. Image courtesy of CMI2.

POLAR -SHOTS being tested in arctic terrain. Image courtesy of CMI2.

Projects for Operations in Locations of Arctic Response – Skis for Howitzer Over the Snow (POLAR-SHOTS)

Goal: Research, develop, and test the following product solutions: (1) lightweight advanced materials, (2) finite element analysis, (3) optimal ski mounting and dismounting procedures, and (4) ski performance and stability characteristics. The product solutions shall achieve optimal over-the-snow flotation characteristics and allow towed artillery access to remote Arctic locations.

Challenge: The 11th Airborne Division (ABN DIV) in Alaska and Soldiers operating in Extreme Cold Weather (ECW) and Arctic environments are unable to maneuver or position Towed Artillery to any location other than prepared surface or hard-packed snow and ice locations, which seriously degrades Field Artillery (FA) operations in any Arctic training and wartime scenario.

Success Summary: In three months, the seed project designed, fabricated, and demonstrated a proof of concept that met all requirements of the Towed Artillery skis, which was observed by the 11th ABN commanding general and vice Chief of Staff of the Army during the Alaska experimentation event.

What's Next: The team is pursuing further test and experimentation in Arctic regions critical to transition.

Partners: University of Montana, Peke Engineering

Assistant Gunner (AG) Bag

Goal: Increase machinegun crews' efficiency, survivability, and lethality.

Challenge: Assistant Gunners (AG) must carry between 200 and 400 rounds of ammunition in addition to the M192 Lightweight Ground Mount Tripod, spare barrel, binoculars, thermal optic, and individual sustainment equipment. The AG position is notorious for bearing the heaviest rucksack in an Infantry Rifle Platoon. The Army requires AG to expediently assist in the feeding, operation, and fire control of an M240L Medium Machine Gun (MMG). Still, no options exist to carry that load in a practical, readily operational format. Bag design encompasses operational functionality and weight distribution optimization, with the sustainment portion readily detached.

Summary Success: The Pathfinder program completed 18 months of testing and evaluation with many units across the XVIII ABN CORPS and Joint Services for AG Bag.

What's Next: EagleWerx is working with Lions Club Industry (LCI) to add the AG Bag to their inventory for purchase at Eagle Mart and other Base Supply Stores (BSC). LCI operates and manages all BSCs within the 18th ABN Corps and many other posts. This will immediately make the AG Bag available for units to purchase using the Government Purchase Card (GPC) or Tailored Logistics System (TLS). An AG Bag is also being tested by the Program Manager Next Generation Squad Weapon (NGSW) – Automatic Rifle (AR) with the new M250 automatic rifle as an Additional Authorized List (AAL) item. Testing began on 15 November 2024.

Both paths have an opportunity for National Stock Number (NSN) assignment.

Partners: Alpen Design Works

Soldiers testing AG in field training exercise. Image courtesy of CMI2.

Female-Fit Rucksack (FFR)

Goal: Identify the root cause of musculoskeletal injuries (MSI) occurring in female Warfighters at a higher rate than male Warfighters.

Challenge: Female Soldiers suffer musculoskeletal injuries (MSI) at a disproportionally higher rate compared to their male counterparts, which may be linked to U.S. Army standard-issue unisex rucksacks. Testing this hypothesis will allow for further biokinetic analysis of female Soldiers to determine how to reduce the injury rate, whether through rucksack wear education or a modification to the current male-centric design.

Success Summary: The University of Montana collected data from various participants including UM students and cadets, and Montana National Guardsmen. The preliminary findings suggest that a combined approach of modified equipment and updated wear education may be necessary to fully mitigate injury.

What's Next: Determining the cause of this issue will further assist in developing a solution to enhance Soldier readiness and lethality. This project's performance period is 31 July 2024, through 14 February 2025.

Partners: University of Montana

Soldier trying on the FFR for size, fit, and durability. Image courtesy of CMI2.

Acoustic Sensors

Goal: Inform Soldiers of the different types of sensors, imperative on the battlefield of tomorrow.

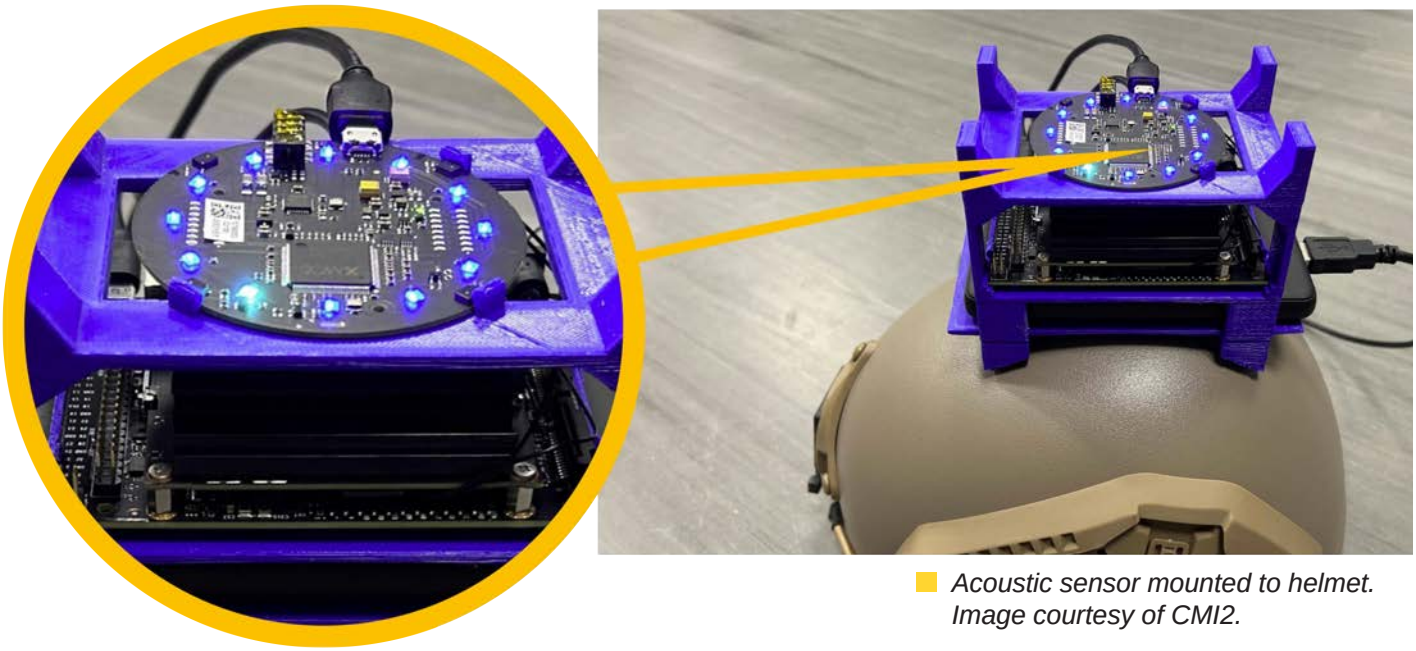
Challenge: The U.S. Army Special Forces Command located at Fort Bragg had a subordinate unit requiring sensors to discern whether helicopters, UAS, and other aircraft were friends or foes, critical to operating in specific areas of responsibility (AOR) with partner forces.

To add to the complexity within the AOR, an aggressor country has similar rotary wing aircraft to the United States and other allies, mainly due to copying military aircraft designs. Although the aggressor aircraft appear similar visually, the acoustic signature is vastly different because the aircraft have different power plants, transmissions, rotors, etc., that adversaries cannot easily copy.

Success Summary: Duke University conducted research to develop an operator- or partner-worn acoustic sensor that integrates into Android Tactical Assault Kit (ATAK) to provide force protection for UAS and other aircraft identification. In March 2024, Duke Robotics lab demonstrated a minimal viable solution.

What's Next: With the success of the sensor and algorithm performance at the culmination of the seed project, a pilot phase kicked off this summer to refine the sensor into a wearable form factor and create kits that will be distributed for operator testing.

Partners: Duke University



Acoustic sensor mounted to helmet. Image courtesy of CMI2.

Partner Force Drone

Goal: Develop a Group One and Group Two sUAS platform that is NDAA-compliant, cheap, replicable, 3D printable, and can be used with Partner Forces in OCONUS Operations.

Challenge: Across the globe, U.S. Special Operations Forces (USSOF) operate by, with, and through indigenous and partner nation forces in various scenarios ranging from training and evaluation to enabling combat operations. These partner forces typically cannot employ local intelligence, surveillance, and reconnaissance (ISR) or U.S. Program of Record (POR) assets to facilitate daily operations.

Success Summary: 5th Special Forces Group, working with DEVCOM, CMI2, and EchoMav in a collaborative project, fully designed, printed, and successfully flown against in a realistic training scenario a Group One sUAS within 6 months of development. The platform comes equipped with either a 2.4 GHz radio or a multi-band, frequency-hopping version capable of maintaining connectivity out to 15km with an approximate flight time of 40 minutes. The nature of the platform is highly modular, 3D printable, and field repairable. For a multi-band radio with a day/thermal camera, the Group One sUAS costs half the cost of the comparable competitors.

What's Next: 5th Special Forces Group will be employing the Partner Force Drone in Joint Readiness Training Center (JRTC) in Spring of 2025 and has plans to deploy the platform overseas for operational needs within FY25. The 101st Airborne Division is purchasing and fielding 100x of the NDAA-compliant version to use as a short-range reconnaissance (SRR) asset and will field the prototype in February at JRTC. The development will continue the Group One platform to incorporate increased software features, a multi-axis gimble for the day/thermal camera, and a refined ATAK integration. Development of the Group Two platform will begin upon the start of the next phase of the project.

Partners: EchoMAV Technologies Inc., 101st Airborne Division, and 5th Special Forces Group (SFG)

Image courtesy of EchoMAV Technologies Inc.

Mission Command Integration Module (MCIM)

Goal: Create a hardware mounting solution to integrate multiple systems in a package designed specifically for the Polaris MRZR Alpha 4, delivering ruggedness and ease of setup and operation.

Challenge: The 75th Ranger Regiment (75th RR) extensively uses the Polaris MRZR as a maneuver, casualty evacuation (CASEVAC), and mission command communications platform for combat operations. They must maintain multiple radios, satellite terminals, network routers, satellite dishes, power supplies, and other digital communications systems. The 75th RR's current equipment is a collection of hardware and components not designed to integrate into the MRZR mobility platform.

Success Summary: Since the project initiation, leveraging large-format additive manufacturing, one prototype has been designed and fabricated that integrates all radios, batteries, common/networking stack, and satellite terminal into one robust package fully supporting 75th RR mission requirements at their annual multilateral joint training exercise.

What's Next: Receive unit feedback on prototype performance during training and integrate it into future versions for further testing and evaluation.

Partners: Auburn University

INNOVATION IN THE DIRT.

MRZR Alpha 4 Litter Support System

Goal: Create a modular system of litters to accommodate 1-3 patients with adequate medic access for the transverse litter; provide a litter solution capable of being removed, stowed, and cross-loaded to alternate MRZR vehicles; and provide the commanders tailorable options for maneuver platforms to execute CASEVAC and continue combat operations.

Challenge: The 75th RR extensively uses the Polaris MRZR as a maneuver and CASEVAC platform for combat operations. The current CASEVAC MRZR configuration consists of two longitudinal litters and one transverse litter. The legacy transverse litter positioning impedes enroute casualty care from medics during evacuation.

Success Summary: One prototype has been designed, fabricated, and delivered for the two longitudinal litters for testing/evaluation in their annual multilateral joint training exercise.

What's Next: Receive unit feedback on prototype performance during training, integrate that feedback into future versions, and continue the design of the transverse litter with later additional testing.

Partners: Auburn University

Image courtesy of CMI2.

Building Predictive Maintenance

Goal: Create a predictive model for the Army Reserve Command (ARC) locations to accurately assess building use and maintenance needed on a dashboard to forecast the commander's budget. The system would predict maintenance based on usage, temperature, and local weather within the model.

Challenge: U.S. Army Reserve Command (USARC) faces a significant challenge in efficiently monitoring its building systems due to two separate systems holding crucial information. The lack of integration between these systems leads to inefficiencies, increased complexity, and a higher risk of errors and oversight.

Success Summary: East Carolina University created a proof of concept that integrated simple sensors into existing reserve command buildings. This allows the deputy director of engineering to forecast his maintenance budget more accurately within the pilot phase.

What's Next: The proof of concept system's accuracy is being evaluated for precision through the pilot phase, to determine cost-savings for the Army, with a potential to save millions in maintenance costs.

Partners: East Carolina University

Field Assessment of Airdropped Blood

Goal: Test and evaluate alternate impact mediums for drop zones such as land, freshwater, saltwater, and the high altitude of the blood resupply.

Challenge: Special Operations currently employ aerial delivery via parachute to supply blood to medics on the ground, assisting in treating wounded casualties. However, the blood packs frequently experience high impact upon landing, raising concerns about the blood's integrity at a molecular level. There is a need for a comprehensive study to investigate the effects of such impacts on the molecular properties of blood and determine the acceptable tolerances for maintaining its suitability for patient use. Furthermore, the study should propose suitable measures to protect blood packs during delivery and mitigate the potential negative impact on their quality.

Success Summary: East Carolina University research showed that changes happen at a molecular level within the blood when subjected to impacts from aerial resupply affecting the usability of life saving materiel.

What's Next: Additional research will be conducted to explore larger blood quantities and diverse environments for impact and landing testing. This research will document the characteristics of blood resupply and what safeguards need to be in place for specific airdrop types, intended to inform DOD medical units.

Partners: East Carolina University

Projects for Operations in Locations of Arctic Response-Touchscreen Reliability Improvement Project (POLAR-TRIP)

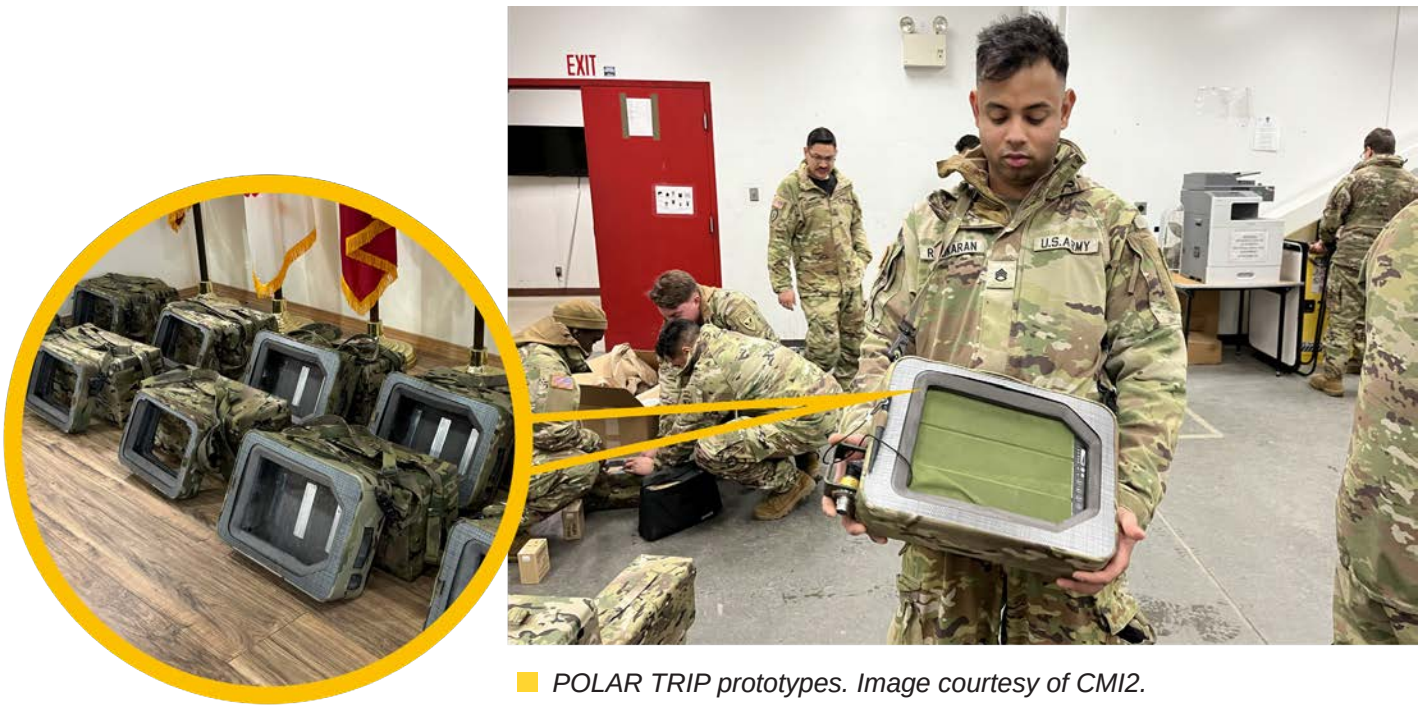
Goal: Manufacture, test, and deliver x5 prototypes of Arctic protection gear (each) for the M777 CSD-R and M119A3 Digital Touchscreens for use during the 2024/2025 winter training season.

Challenge: The 11th ABN in Alaska and Soldiers operating in ECW and Arctic environments are experiencing LCD and touchscreen failures resulting from exposure to subzero temperatures.

Success Summary: Initial prototypes showed improved operations in ECW environments, leading to a pilot project.

What's Next: The prototypes shipped to 11th Airborne Division and will be installed onto the Tablets, amd the prototypes will be deployed to the field during the Joint Pacific Multinational Readiness Center (JPMRC) exercise in Alaska during the winter of 2025.

Partners: University of Montana



POLAR TRIP prototypes. Image courtesy of CMI2.

Phantom

Goal: Develop a deployed stand-alone packaged solution that accomplishes the RETRANS mission and the following objectives: (1) enable remotely monitored retransmission communications, (2) reduce RETRANS team's Arctic exposure and forward footprint, (3) eliminate reliance on the VHA, and (4) reduce or eliminates logistical support requirements for in-field sustainment.

Challenge: The 11th ABN DIV in Alaska and the U.S. Army lack a resilient energy storage/battery solution for Retransmission (RETRANS) teams operating Tactical Scalable Mobile Ad-Hoc Network [MANET] (TSM) and Ghost radios in ECW and Arctic conditions, that is not reliant upon the variable height antenna (VHA) and eliminates a significant Soldier footprint required to support the RETRANS mission.

Success Summary: Over the past year, the Phantom seed project has designed, developed, and delivered three (3) phantom prototypes to 11th Airborne Division, 2nd Infantry Brigade Combat Team (IBCT), and 3-509th Parachute Infantry Regiment (PIR) for field experimentation and end-user feedback. The first Phantom prototype was successfully deployed to remote Arctic environments in Alaska, where it performed communications and data retransmission missions in temperatures below -20C and could remain in place for 5 days without needing maintenance, battery replacement, or Soldier care.

What's Next: The first Phantom prototype's success informed the next-gen Phantom prototype iteration, which will be deployed to the field during the JPMRC exercise in Alaska during the winter of 2025 to determine baseline temperature related performance data, gauging the impact on battery life at varying temperatures.

Partners: Montana Tech

Phantom prototype being tested in arctic conditions. Image courtesy of CMI2.

PATHFINDER SUCCESS

Direct Action Penetrator [DAP] Operational Optimization Resolution (DOOR)

Since 2007, crewmembers have reported negative cognitive and physical symptoms following aerial gunnery missions, such as dizziness, headaches, and confusion. These symptoms impact Soldier readiness and effectiveness in the short term, but long-term effects are largely unknown. The 160th Special Operations Aviation Regiment (SOAR) (Airborne) uses DAP for close combat attack missions and aerial gunnery training. These missions' extreme flight profiles and weapons configurations expose aviators and crewmembers to vibration and blast overpressure from weapons mounted near crew stations.

Researchers from Vanderbilt University and Vanderbilt University Medical Center have designed and built a novel, biofidelic headform with embedded sensors that measure overpressure forces inside the skull, auditory, and visual systems. The research team has also begun identifying post-flight and long-term effects of gunnery training with a battery of assessments focusing on cognitive, visual, auditory, and vestibular performance. In addition, researchers used the bio-fidelic instrumented headform to study exposure levels and test different helmets in the explosive breaching environment at U.S. Army Special Operations Command. The project evaluated multiple combinations of 10 mitigation strategies for the M134 minigun employed on the 160th DAP aircraft. It provided data-driven recommendations for the most effective mitigation strategies in that unique environment.

What's Next: Aircrew assessments will continue to develop more robust data on acute and long-term effects. The research team works with the newly formed U.S. Army Special Operations Command (USASOC) Elite Forces Pilot Team to explore further applications and mitigations in the explosive breaching training environment. The team is exploring applications and collaborating with PEO Soldier, the Defense Health Agency, Naval Special Warfare, and the Army Health Hazard Assessment team, which is now required to assess blast overpressure risk from weapon systems in addition to respiratory and auditory effects.

Partners: Vanderbilt University, Vanderbilt University Medical Center

Image courtesy of Sonny Tapia, Independent Record.

DIRT Labs

The Design, Innovation, Research, and Technology (DIRT) Labs, collaborative innovation spaces created through a partnership with DEVCOM and the Civil Military Innovation Institute (CMI2), allow specialization and solution development to support Warfighter technology modernization, whether in a general makerspace facility or a specialized space.

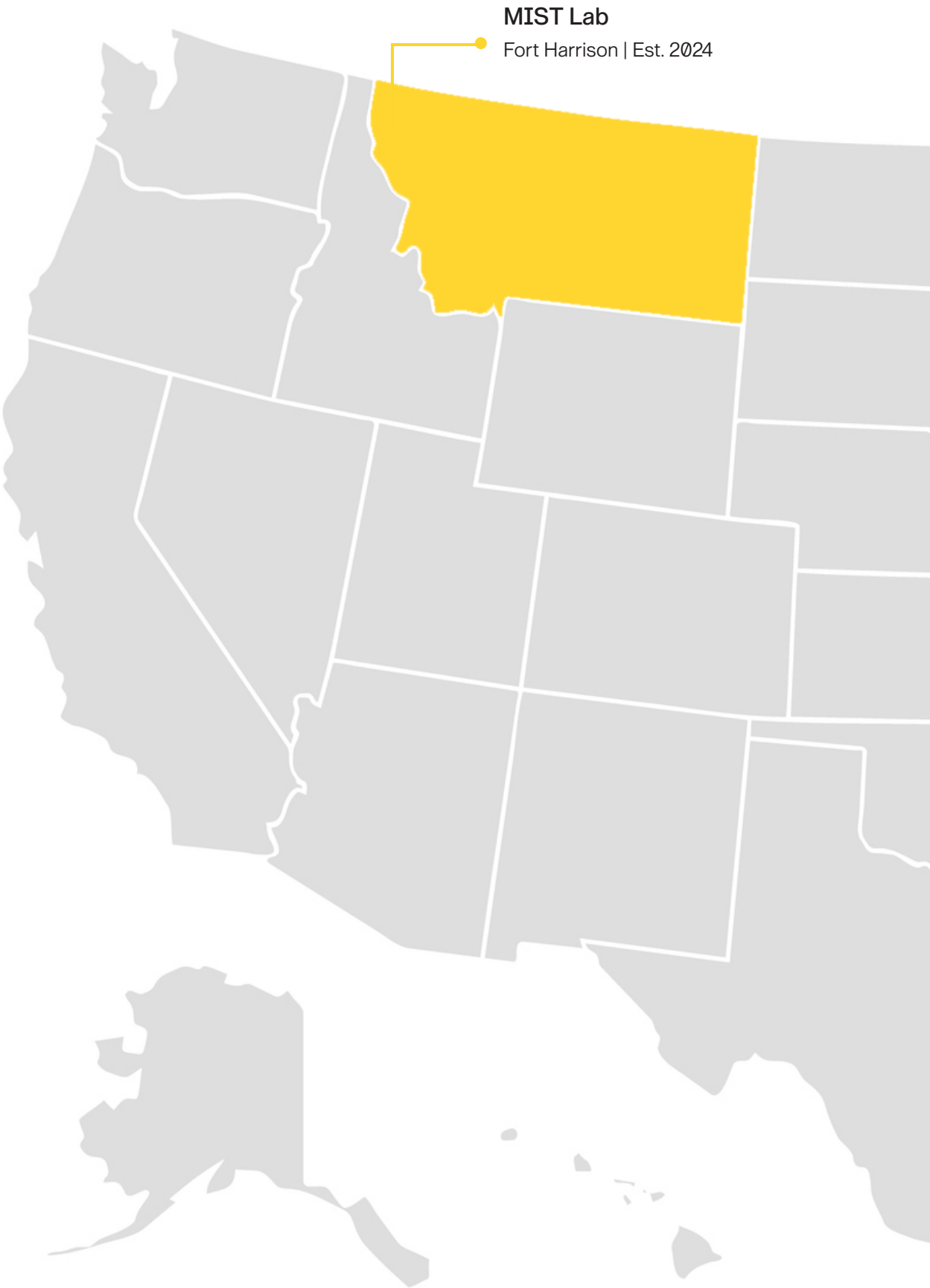
The inaugural DIRT Lab, Fort Campbell's Applied Tactical Innovation Center (ATIC), was the first of the DIRT Labs opening in 2021. To date, the DIRT Labs innovation opportunity has nine locations globally, including mobile options available to deploy to the field with units.

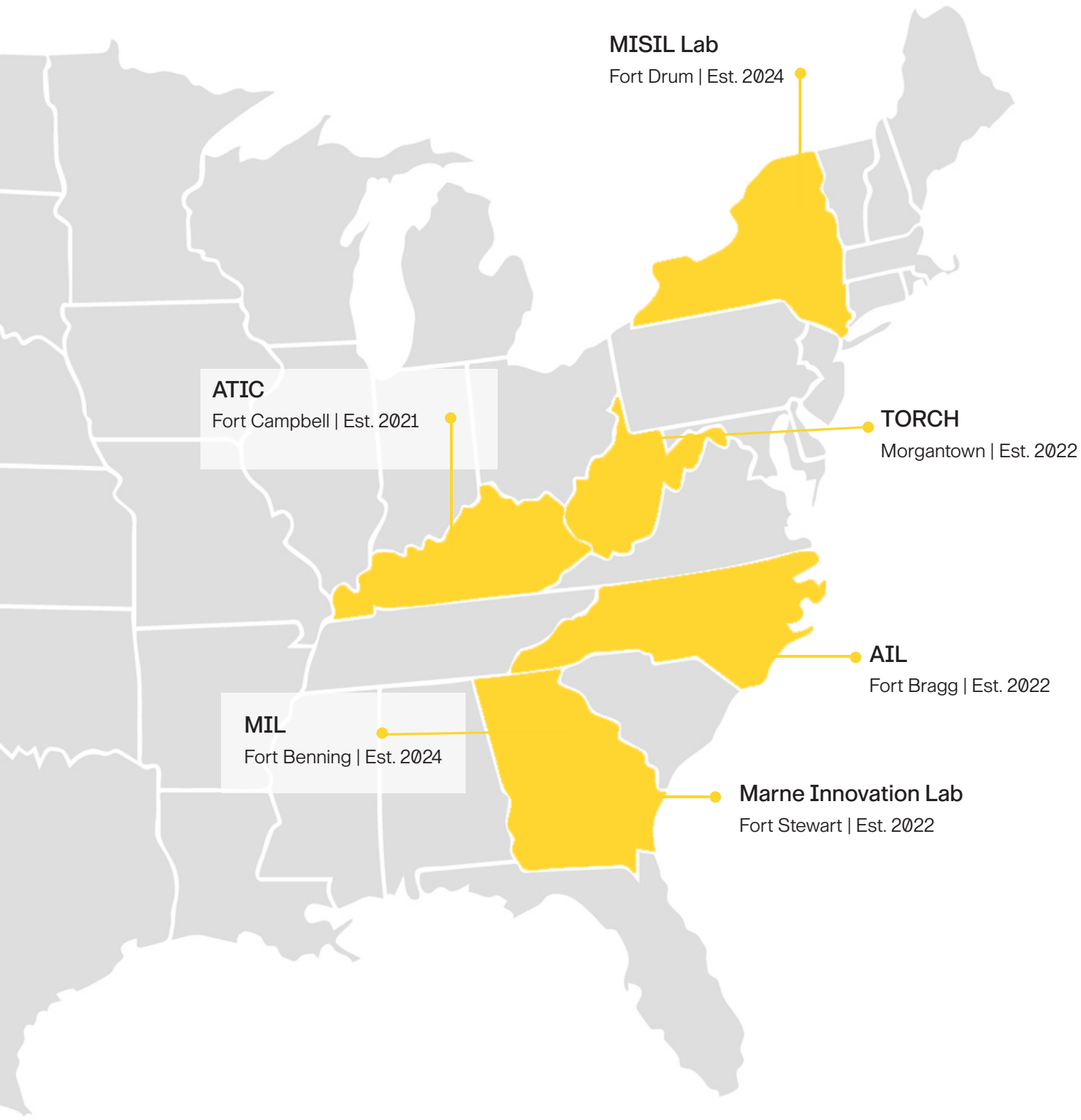
Fort Bragg's Airborne Innovation Lab is becoming the pinnacle for Army innovation as the home of Special Operations or conventional Army units, such as the 82nd. The Airborne Innovation Lab continues to ride the boundaries between reality and conceptual design to master the art of bringing Soldier-driven ideas to the Warfighter.

The other DIRT Labs are:

> Marne Innovation Center: Fort Stewart, GA
>
> Mountain Innovation Systems Integration Lab (MISIL): Fort Drum, NY
>
> Tactical Operations for Cybersecurity Hub (TORCH): Morgantown, WV
>
> Mobile Immediate Need Engineering Resource (MINER): *Mobile DIRT Lab
>
> Mountain Innovation and Simulation Technology Lab (MIST): Fort Harrison, MT
>
> Maneuver Innovation Lab (MIL): Fort Benning, GA
>
> ARCENT Innovation and Manufacturing Center (AIM-C): Camp Arifjan, Kuwait

The various Pathfinder program DIRT Labs encourage tactical innovation for the Army by creating a progression for frontline concepts to become prototyped solutions (allowing the ideas generated to transition from the abstract to the actual). There have been over 300 projects completed in the DIRT Labs, but only a few examples are highlighted in the next section (DIRT Lab Highlights).





2024 DIRT Lab Project Highlights

Virtual Reality (VR) Mine Clearing Line Charge (MICLIC) Trainer

Goal: Develop a cost-effective training solution for MICLIC Engineering crews that allows teams more time on the systems and improves overall proficiency in setting up and firing the MICLIC.

Challenge: Training M58 MICLIC operators within the U.S. Army faces significant challenges due to the limited availability of live ammunition, the complexity of the training process, and stringent safety requirements. The MICLIC, a critical demining system that uses a rocket-projected line charge containing C4 explosives, requires precise execution of complex steps. Currently, training options are constrained by shortages of live and training rockets and safety protocols that restrict the number of personnel who can engage in consistent practice. This limitation hinders the ability of Soldiers to maintain proficiency with the system, impacting overall mission readiness and effectiveness.

Success Summary: The VR MICLIC trainer developed by ARCS Aviation, a Tennessee-based small business contracted by CMI2 under the Catalyst Pathfinder program, in collaboration with Soldiers from the 101st Airborne Division, allows Soldiers unconstrained training and testing on the trailer version of the MICLIC. The cost of the VR MICLIC trainer is less than the cost of three training rounds for 50 sets with annual maintenance. While this trainer is not intended to replace Soldiers firing training and live rounds, their training and readiness can be significantly improved at a fraction of the cost of live rounds. Furthermore, it allows other Engineer Soldiers to cross-train on the MICLIC at no additional cost to units.

What's Next: Development of the VR MICLIC will continue into a pilot development phase with continued input from Soldiers in the 101st Airborne Division and other units over FY25.

Partner: ARCS Aviation
DIRT Lab: EagleWerx ATIC

Radio Cooling Case

Goal: Develop a means to prevent the AN/PRC162 radio from overheating.

Challenge: The 82nd ABN regularly employs the AN/PRC162 radio, which is prone to overheating, particularly during multi-channel operations (MCOs). This excess heat poses various risks, including the radio powering down and occasional burns to soldiers.

Success Summary: Performers designed an initial cooling case to incorporate two 40mmx40mm 5v fans, powered by a USBC input located at the rear of the case. These fans draw in ambient air, directing it vertically through the radio's heatsink cooling fins and channels. Testing revealed a significant reduction in surface temperature, averaging 22%.

What's Next: The Project Manager Tactical Radio (PM TR) is evaluating the project for adoption.

DIRT Lab: Airborne Innovation Lab (AIL)

Bradley Cable Cover

Goal: Create a 3D-printed data cable cover to protect the cables from damage during vehicle entry and exit.

Challenge: The Bradley data cables are easily kicked and damaged when entering or exiting the vehicle, which deadlines the vehicle. The data cable set costs approximately $4,000.00, and the lead time can be 3-6 months.

Success Summary: The 3ID Marne Innovation Center team designed and 3D printed a data cable cover for the Bradley. It was tested on-site at Fort Stewart successfully, and 72 data cable covers were 3D printed for 1ABCT at a cost of $12.00 prior to their NTC rotation. During this last NTC rotation, no vehicles were reported deadlined due to data cable damage. The potential cost savings is over $200,000.00.

What's Next: The Bradley Data Cable cover has been added to the Advanced Manufacturing Data Repository (AMDR) for anyone authorized to download and attach to their vehicle. 3D printing files are available, along with instructions for assembly.

DIRT Lab: Marne Innovation Center

Vehicle Integrated Camo System (VICS)

Goal: Adapt camo pole mounts to an Armored Multi-Purpose Vehicle (AMPV) so they are adjustable and retract easily for swift mobility.

Challenge: Typically, it takes four Soldiers 30 minutes to set up camo poles over a vehicle.

Success Summary: Worked with Soldiers from an infantry unit to develop a ground mount for quick deployment for camo poles. This project won the “Top Innovation” award at Dragon Lair X. With the new VICS, two Soldiers can set up camo nets in 15 minutes. This system is easily adaptable to other vehicles. As requested, the VICS is available to Allied Trades shops for production at the units.

What’s Next: The project is being evaluated for transition to Project Manager Expeditionary Energy and Sustainment Systems (PM E2S2) as part of the Ultra-Lightweight Camouflage Net System (ULCANS) system. Files have been sent to Soldier Center PIF at Natick, Program Executive Office, Combat Support & Combat Service Support (PEO CS&CSS), and Command, Control, Communications, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) so they can quote manufacturing at scale when funding becomes available.

DIRT Lab: Marne Innovation Center

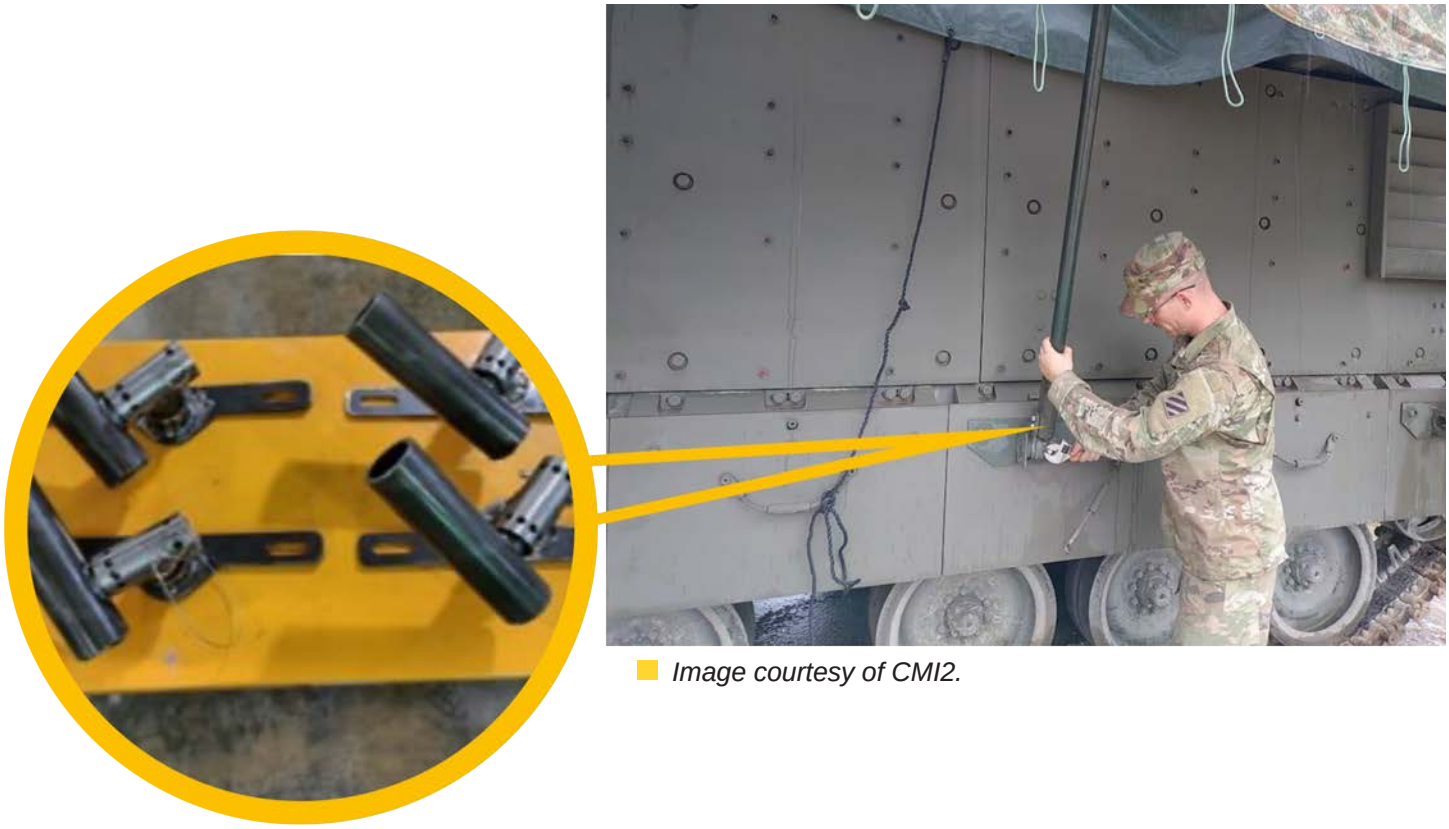


Image courtesy of CMI2.

Catalyst Pathfinder program supports Soldier innovations

In September 2024, for the fourth consecutive year, an innovation initiated through the Catalyst Pathfinder program, managed by the DEVCOM ARL, won the XVIII Airborne Corps Dragon's Lair competition.

Tactical innovation solutions developed and designed by Soldiers with the support of the Pathfinder program and its Marne Innovation Center have successfully won Dragon's Lair VII, VIII, IX, and now X. Further, Pathfinder-supported innovations have not only won the innovation competition but have also been named as Dragon's Lair finalists.

The Dragon's Lair competition is a Shark Tank-style competition started in 2020 by XVIII Airborne Corps to give service members of all ranks a platform to convey their innovative ideas and concepts to civilian technical experts and senior military leaders.

Dragon's Lair X was held the first week in September in Stuttgart, Germany. SFC 1st Class Nathan Lopez, a former sniper and the non-commissioned officer-in-charge at the Marne Innovation Center at Fort Stewart, Georgia, and the VICS came out on top in the competition.

The initial concept and project forerunner for the VICS was a ground-based camouflage system. SFC Lopez utilized the VICS product concept of ground camouflage to translate it and develop an option for vehicle support with the guidance and support of the engineering team at the Marne Innovation Center.

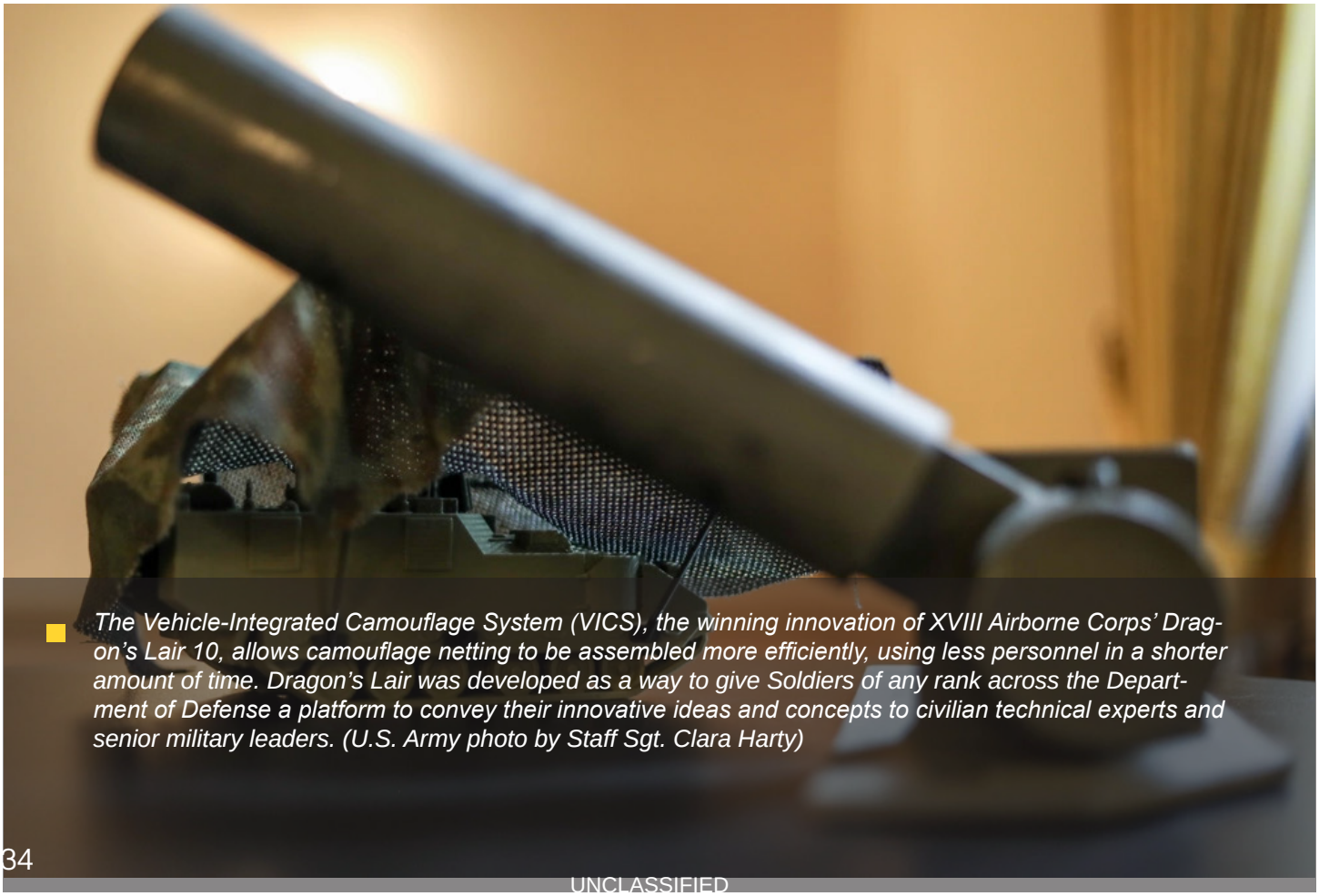
The center is part of the network of innovative spaces known as a DIRT Lab.

The Army's Pathfinder program integrates academic partners and Soldiers in collaborative teams to solve technical problems defined by Army units. The program is a collaboration between DEVCOM and CMI2, managed by DEVCOM ARL in close partnership with the DEVCOM Armaments Center.

The VICS allows two Soldiers to conceal a large combat vehicle in less than 15 minutes, requiring just a few metal-welded brackets with a cylindrical device to attach camo netting poles for concealment. The same job traditionally required four Soldiers and took 30 minutes.

> The collaboration between Soldiers at Fort Stewart and our innovation partners at the Marne Innovation Center is outstanding. Since the opening of our DIRT Lab at Fort Stewart in 2022, we have seen a significant increase in tactical innovation ideas and engagement, and we appreciate DEVCOM ARL and CMI2 for making that happen.
>
> **Major General Christopher R. Norrie, 3rd Infantry Division at Fort Stewart**

Command Sgt. Maj. Robert Abernathy, senior enlisted leader, U.S. Army European Command, and Brig. Gen. John Cogbill, deputy commanding general, XVIII Airborne Corps, present Sgt. 1st Class Nathan Lopez, the NCOIC of the Marne Innovation Center, 3rd Infantry Division, a Meritorious Service Medal after XVIII Airborne Corps' Dragon's Lair 10 at Patch Barracks, Stuttgart, Germany, September 6, 2024. Lopez won first place in the competition for presenting 'Vehicle-Integrated Camouflage System', earning him the award, a military school of choice, and the necessary resources to continue his innovation. (U.S. Army photo by Staff Sgt. Clara Harty)



The Vehicle-Integrated Camouflage System (VICS), the winning innovation of XVIII Airborne Corps' Dragon's Lair 10, allows camouflage netting to be assembled more efficiently, using less personnel in a shorter amount of time. Dragon's Lair was developed as a way to give Soldiers of any rank across the Department of Defense a platform to convey their innovative ideas and concepts to civilian technical experts and senior military leaders. (U.S. Army photo by Staff Sgt. Clara Harty)

U.S. Army Sgt. Malakhi Perry poses beside a Pathfinder program poster at the Marne Innovation Center during Marne Week on Fort Stewart, Georgia, Nov. 18, 2024. Every year, 3rd ID celebrates Marne Week to highlight the heritage of Dogface Soldiers and the history of the division. (U.S. Army photo by Capt. Lydia Laga)

OCONUS DIRT Lab

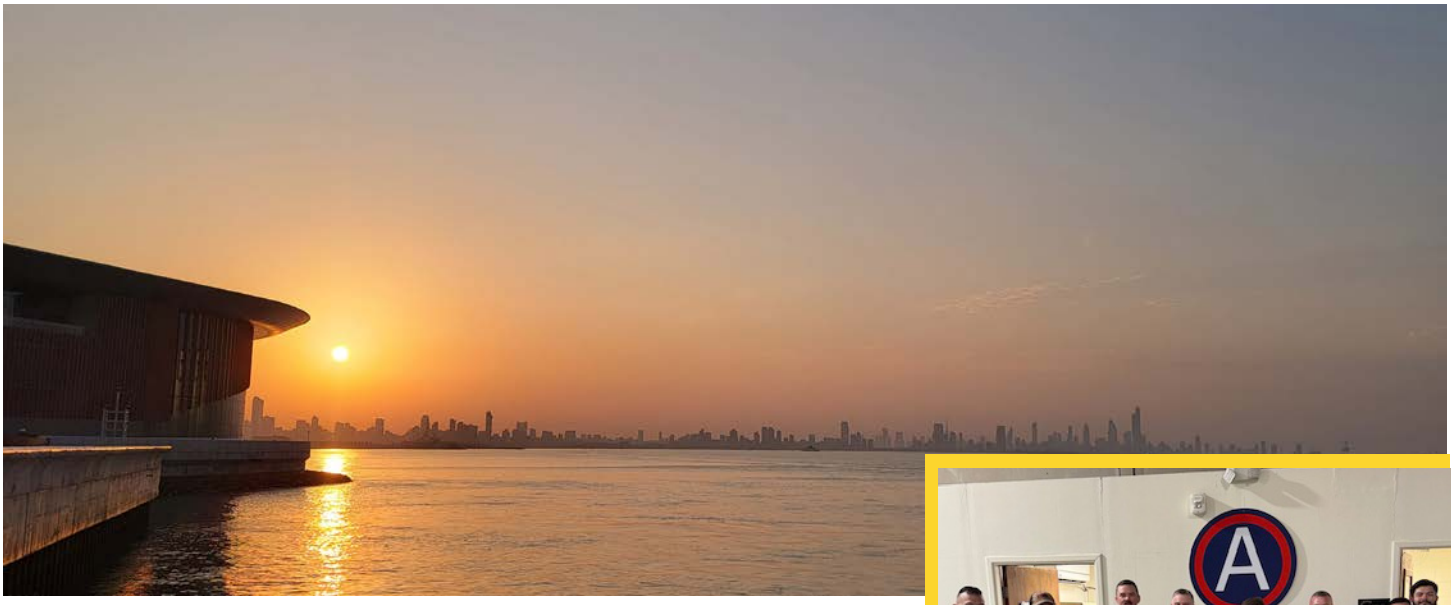
The U.S. Army Central opened its new ARCENT Innovation and Manufacturing Center (AIM-C) on Camp Arifjan, Kuwait, on 27 September 2024. The AIM-C is the first permanent outside of the continental U.S. (OCONUS) installation of a DEVCOM ARL Pathfinder program DIRT Lab.

ARCENT is the Army Service Component Command for United States Central Command and is responsible to the Secretary of the Army for the support and administration of more than 12,000 Soldiers, including those assigned to joint task forces and embassies, across the 21 countries in the CENTCOM AOR.

In addition to tactical innovation support onsite from CMI2, staffing for the facility includes service members sourced from existing units in Kuwait, with the majority coming from Task Force Spartan and 1st TSC, enabling direct feedback from service members to the AIM-C.

The DIRT lab does the innovating/prototyping while the Machinist Working Metal Shops Set(MWMSS) does the manufacturing and fielding.

Images courtesy of CMI2.



Images courtesy of CMI2.

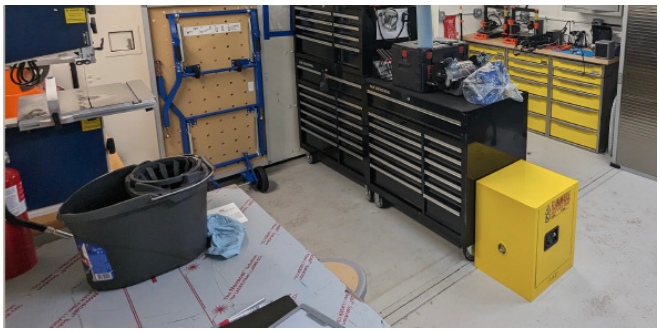
MINER

The MINER is a mobile makerspace unit created to support Soldier-driven tactical innovation.

The MINER facilities are field-constructed DIRT labs equipped with 3D printers, computer-aided design (CAD) stations, laser cutters, CNC mills, and a variety of other metal forming, electronic development, and other workshop tools.

Designed to create a progression for frontline concepts to become prototyped solutions, the MINER allows bottom-up concepts to transition from the abstract to the actual.

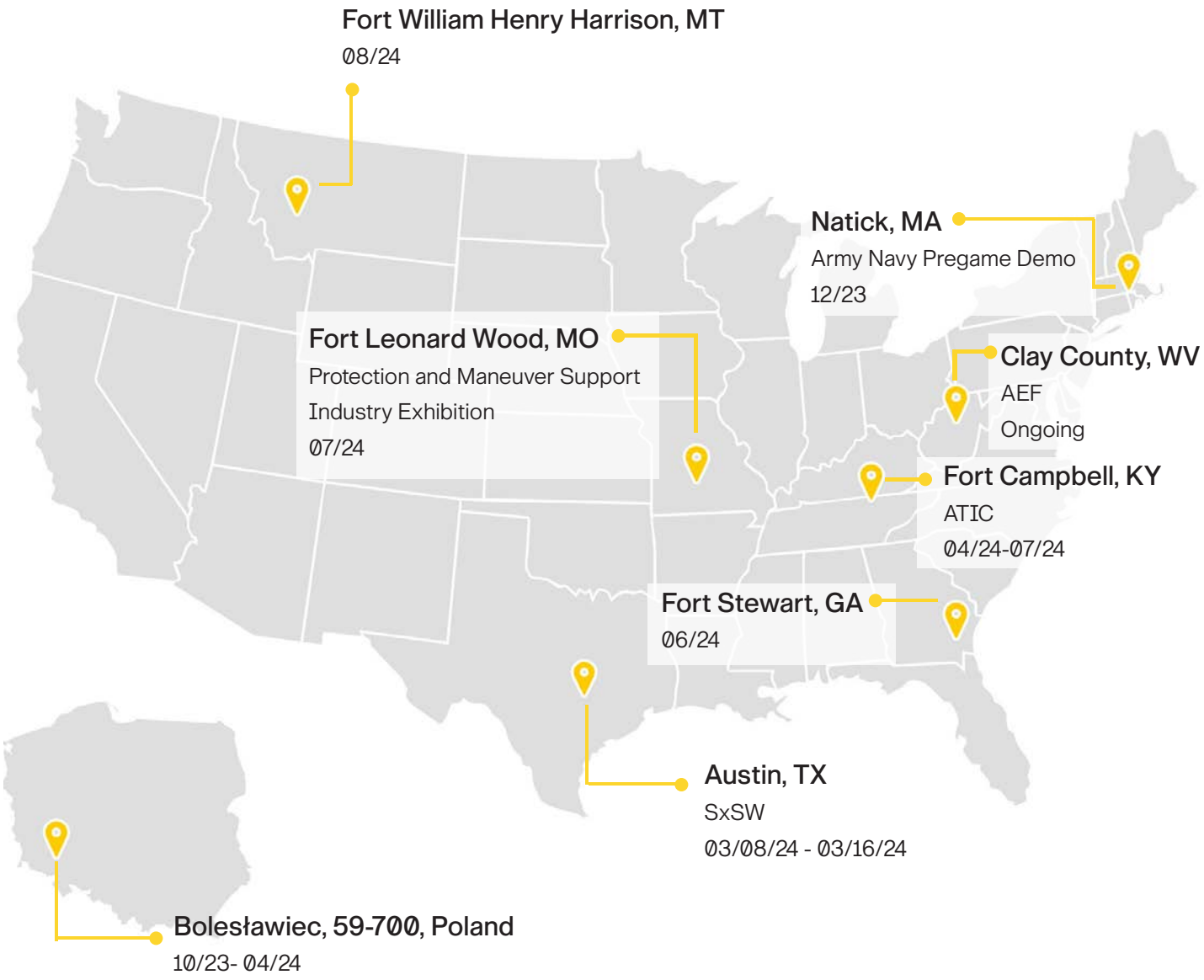
A MINER was deployed to Europe in FY23. In August 2024, a permanent MINER was installed for field use with the Montana Army National Guard, the first of its kind for a National Guard installation.



MINER
Mobile Immediate-Need Engineering Resource

Images courtesy of CMI2.

MINER Deployments FY24



Accelerating FORCE

Focusing on Integration and Experimentation Technology for Soldiers

DEVCOM ARL's Accelerating Future Operational Requirements, Capabilities, and Experimentation (FORCE) program research methods to accelerate technology delivery to Warfighters. The Accelerating FORCE program works with concept developers from the Futures and Concepts Center (FCC), program offices under the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASA(ALT)), Soldiers, units, and other DEVCOM Centers to identify capability gaps in U.S. Army requirements and analyze non-traditional technology delivery solutions for its Future Force Requirements Experimentation (FFRE) methodology. Accelerating FORCE executes case studies to inform the methodology.

The FFRE methodology is a collection of all experimentation event data and activities to discover novel approaches to accelerating technology delivery to the Warfighter. The Accelerating FORCE program partners with small businesses to develop technology with the potential to meet capability gaps, having the potential to earn permanent transitions to Program of Record (POR) funding or inform future requirements. Accelerating FORCE's thesis is that the earlier a technology is experimented with in a realistic environment with Soldiers, the more likely it will operate as intended.

Established in June 2022, the Accelerating FORCE program has successfully transitioned 100% of technologies and information under its portfolio to outside funding sources or through direct information on future requirements.

The program focuses on conducting experimental case studies to validate the new methodology. The following are the Accelerating FORCE technology target focus areas:

Assured Communications: Discover emerging technologies which can enable greater mobility, reliability, lower latency, higher bandwidth increased efficiency, and broader coverage of communications.

- **Spectrum Exchange (SpEX)/Tactical High-Speed Robust Low Probability of Intercept/Low Probability of Detection System [THRILLS])**

Advanced Sensing: Discover emerging technologies which can enable autonomous or semi-autonomous detection of personnel or objects to secure mobile or fixed command posts.

- **Advanced Dynamic Spectrum Reconnaissance-Sensor Network (ADSR-SN)**

Contested Logistics Portfolio: Discover emerging technologies which can enable autonomous freedom of maneuver for forces in a contested environment with near-peer adversaries.

- **Tactical Resupply Vehicle (TRV)-150C**

By the Numbers

4

Industry Projects

100%

Technology transitions under Accelerating FORCE for FY24 were four for four.

17

Field Experimentation Events in FY24

12

Partner Units

U.S. Army photo by Spc. Samuel Bonney.

Accelerating FORCE Project Highlights

Image courtesy of CMI2.

U.S. Army photo by Sgt. 1st Class Neysa Canfield/10th MDSB PAO.

Tactical Resupply Vehicle (TRV-150C)

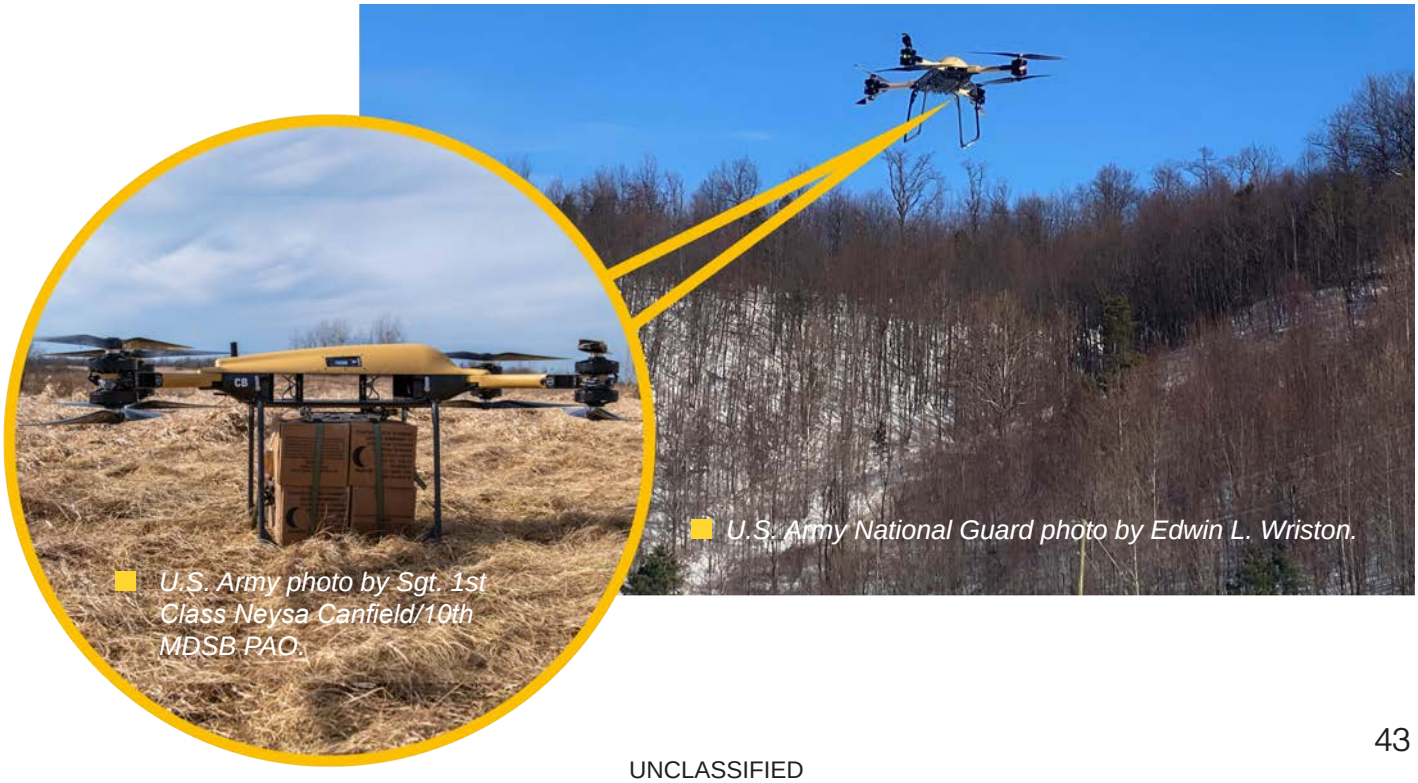
Goal: Provide resupply capabilities across distributed geography to support maneuver within division-centric formations across all echelons and in environments with adversarial kinetic and non-kinetic threats.

Challenge: Soldiers need the ability to resupply with life-saving materials, such as food, water, ammunition, etc., in various dangerous and difficult-to-access locations. By using a UAS, Soldiers do not get in harm's way while providing sufficient means and equipment to complete the mission. The TRV-150C is an autonomous UAS capable of carrying up to 150 pounds of payload and designed to autonomously resupply small units over the last tactical mile in austere environments.

Success Summary: Soldiers participated in multiple experimentation events, such as Operation Mountain Peak for the TRV-150C in Fort Drum, New York, supported by CMI2 (See more experimentation events on page 46). Accelerating FORCE produced a report on each event, including quantitative and qualitative data. At the end of the assessment period in September 2024, the program produced a final experimentation and assessment report on all experimentation events in partnership with PM UAS and the Sustainment Capability Development Integration Directorate (S-CDID).

What's Next: The Accelerating FORCE program will continue experimentation with the TRV-150C at Fort Andrew and various locations across the world. Using the TRV-150C in diverse scenarios closely simulating real-world operations will provide critical data for the Accelerating FORCE methodology, technology research and development within Survice Engineering and DEVCOM ARL, and potential future fielding for transition partners and other stakeholders.

Partner: Survice Engineering



U.S. Army photo by Sgt. 1st Class Neysa Canfield/10th MDSB PAO.

U.S. Army National Guard photo by Edwin L. Wriston.

Advanced Dynamic Spectrum Reconnaissance-Sensor Network (ADSR-SN)

Goal: Enhance Army combat readiness through AI-enabled radio technology.

Challenge: In December 2023, Accelerating FORCE received a memorandum for Request for Capability, ADSR-SN from the Special Operations Task Force-Levant (SOTF-L). SOTF-L requested the ADSR-SN capability to enhance the unit's force protection against threats of one-way UAS.

Success Summary: In May 2024, Xtremis deployed one ADSR-SN to CENTCOM to collect data and answer the SOTF-L request. In March 2024, Xtremis conducted a system demonstration on the ADSR-SN to partner forces.

The Accelerating FORCE identified a DOD entity with funding and a transition path for the technology. 7ATC and USAEUR-AF paid for an extended operational experiment with the ADSR-SN at Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany, for an extended operational experiment.

The ADSR-SN was part of the Network Modernization Exercise (NetModX, NMX), an annual experiment conducted by the Army DEVCOM C5ISR Center in which technologies from the lab are fielded to stretch the limits of their operating environment and put them through their paces. This informed future requirements and exposed PEO IEW&S to ADSR-SN capabilities.

What's Next: Accelerating FORCE will continue to enhance ADSR-SN with feedback from end-users to improve the system's usability in different environments. The team will collect information across the technology's use cases to inform POR requirements.

Partner: XTREMIS.AI

Images courtesy of CMI2.

Spectrum Exchange (SpEX)

Goal: Create an AI-enabled scheduling appliance with a Spectrum Orchestration Automation and Response (SpOAR) to enhance the Army's ability to dominate NextG networks.

Challenge: The modern networked battlefield relies on wireless communication and sensing devices. Challenges from adversaries, particularly near-peer competitors, and the general presence of a crowded radio spectrum can interfere with friendly radios. Both instances cause availability loss of communications between friendly forces, leading to dangers to on-the-ground Warfighters. Soldiers across the Army and Army leadership have identified the need for Fifth Generation (5G) and Next Generation (NextG) spectrum sensing and management technologies.

Success Story: SpEX increased spectrum managers' ability to support exercises by 600% as opposed to manual methods.

What's Next: SpEX is supporting all spectrum management requests for Operation Lethal Eagle, a 101st Division Exercise. The event will include generating user accounts for a large exercise and will inform ACM-EW's requirements for the future of Spectrum Orchestration and Automation (SpOAR). Within the next year, Accelerating FORCE seeks to inform future requirements and plan the transition of SpEX to a DOD POR.

Partner: SpEX

Tactical High-Speed Robust Low Probability of Intercept/Low Probability of Detection System (THRILLS)

Goal: Provide a highly secure, self-healing, high-speed communication network that integrates into existing military communication infrastructure while maintaining a low probability of interception (LPI) and low probability of detection (LPD) to ensure a seamless exchange of critical information among military personnel without compromising operational security.

Challenge: The U.S. Army needs a cutting-edge solution that effectively addresses the capability gap for high data rates and mobile communications with minimal detectability.

Success Story: Through the initial phases of the THRILLS case study, Accelerating FORCE worked with C5ISR and FirstRF scientists to discover an applicable scenario to experiment with THRILLS.

Concepts for the first THRILLS experimentation event led to a thoroughly planned experimentation approach incorporating the THRILLS system built for the future Army while still having current Army approaches considered.

What's Next: Accelerating FORCE has has three more field experiments planned over the next 18 months, including at Project Convergence Capstone 5 (PCC5) in collaboration with C5ISR Center.

Partner: First RF

Accelerating FORCE Experimentation

A key aspect of the collaborative programs from Catalyst to Pathfinder to Accelerating FORCE is the commitment to identify opportunities for beta testing new technologies and validating prototypes through field experiments and real-world scenarios. Throughout FY24, specific experimentation events were planned for each program to gather crucial Soldier feedback on innovations and technology assessments.

The following information outlines the experimentation events related to the DEVCOM ARL-developed TRV-150C.

DEVCOM, in collaboration with CMI2 and Survice Engineering, developed and implemented an experimentation plan. The team divided these experiments into Stated Research Goals (SRGs) and evaluated individual capabilities of the TRV-150C TRUAS variant platform in an operationally realistic manner.

> “It’s really easy to send supply out with this. I don’t have to wait for a convoy just to get someone fed anymore.”
>
> - 10th Mountain Soldier feedback following experimentation with the DEVCOM ARL-developed TRV-150C as part of the large-scale combat training maneuver event at Fort Johnson, Louisiana.

Mountain Peak (Fort Drum, NY)

The 10th Mountain Division Soldiers supported a large maneuver exercise at Fort Drum, New York. The missions encompassed actual resupply drops to forward units, simulated supply missions for data gathering and experimentation, and showcased flights for distinguished visitors (DVs). Supply Soldiers took complete logistical control (staging aircraft, charging aircraft batteries, and maintaining spectrum control) of the TRV-150C. Logistics Soldiers successfully supplied downrange units with resupply requests as they were received.

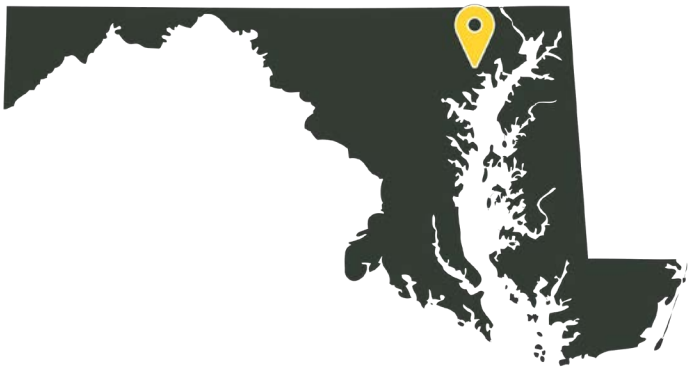
The team gathered post-training survey data points that helped to shape iterative design and improvements for operationalization. For example, Soldiers provided extensive feedback on the speed at which they could complete automatic mission planning in complicated missions, with ideas on how to improve efficiencies. This feedback will be included in a continuing line of effort from Survice Engineering to improve automatic mission planning. Additionally, Soldiers requested that the TRV-150C ATAK plugin be available for their unit's devices rather than isolated to the vehicle's tablet. Mission planning and specific operations on a smaller screen would be complex, but general situational awareness would increase in units equipped with ATAK-connected devices.

U.S. Army photo by Sgt. 1st Class Neysa Canfield/10th MDSB PAO.

U.S. Army National Guard photo by Edwin L. Wriston.

U.S. Army photo by Sgt. 1st Class Neysa Canfield/10th MDSB PAO.

PM UAS Initial Flight Qualification Master Trainer Course (SURVICE Engineering Applied Technology Operations, Aberdeen, MD)



Accelerating FORCE conducted experimentation around a Master Trainer (MT) Course critical to PM UAS learning demands. MTs received initial flight qualification (IFQ) and additional training related to deploying, operating, and troubleshooting TRV-150C vehicles. Additionally, the MTs provided necessary insight into integrating the TRV- 150C into Army training and doctrine. PM UAS Soldiers created missions, rigged payloads, and dispatched the vehicle as a Soldier unit would in the field.

Accelerating FORCE utilized this event to collect critical information on CC training implementation for PM UAS. Accelerating FORCE collected data to inform PM UAS on (1) timelines associated with a training course to feed Army TRADOC doctrine once the Army implement JTAARS across the force, (2) DOTMPLF-P analysis, and (3) tactical use of TRV-150C, based on feedback from 15 series MOS UAV operators.

JRTC (Fort Johnson, LA)

Accelerating FORCE supported the 10th Mountain Division Sustainment Brigade's (DSB) rotation at JRTC with assets and subject matter experts (SMEs) to collect data on the TRV-150C TRUAS.

10th Mountain Division DSB Soldiers facilitated the first use of the TRV-150C at JRTC and Accelerating FORCE's research outcomes included identifying tactical employment of the TRV-150C in an operational environment. Soldiers decided where and at what times to launch the TRV-150C in order to avoid surveillance by opposition forces. Tactics, techniques, and procedures utilized in this event by Soldiers fed information to PM UAS on how the Army can employ the TRV-150 in a contested environment.

Northern Strike (Camp Grayling, MI)

Soldiers from the 2-19th SFG supported the large National Guard training exercise at Camp Grayling, Michigan, known as Northern Strike. The Soldiers operated the TRV-150C from various administrative and tactical deployments. The assessment event at Northern Strike gave Accelerating FORCE the largest amount of data of any event. This provided PM UAS with reliability and operational data. The TRV-150C moved over one ton of material throughout this exercise across a variety of ranges. Accelerating FORCE identified technical issues from this event, resulting in vendor developed patches in development, both software and training and doctrine remedies. The culminating flights for this event were multiple 10 km flights with more than 120 pounds of various classes of payload.

Images courtesy of CMI2.

JMRC (Hohenfels, Bavaria, Germany)

The 1st Brigade Combat Team (BCT), 101st ABN (Air Assault) requested to experiment with the TRV-150C at the Joint Multinational Readiness Center (JMRC) in Hohenfels, Germany. October-November 2023, the Accelerating FORCE team conducted resupply missions with the TRV-150C in a European environment. The Accelerating FORCE team conducted this as the first official event in data collection on the TRV-150C TRUAS configuration. The research outcomes of this event allowed Accelerating FORCE to inform the Army on UAS operations in Europe during a large scale exercise. Accelerating FORCE proved the assumption that Soldiers of various MOSs can become proficient on the TRV-150C in three to five days.

101st Initial Flight Qualification (IFQ)

Soldiers from the 101st ABN DIV participated in IFQ and operational field exercises for the TRV-150C at Fort Campbell, KY as the final event of the JTAARS experimentation event series. This group of nine Soldiers contained MOSs, such as 11B, 12B, 15W, 91B, 74D, 35F, and 91E. Accelerating FORCE utilized this opportunity to enhance the TRV-150C flight qualification curriculum. Accelerating FORCE collected information on standardizing a systems approach to training and techniques of military instruction to produce a system operator.

"As a Battalion Movement Coordinator, I can see this drone becoming a key component in pushing the supply chain safely to the front lines of combat. I feel privileged to be involved in the testing of this product."

101st Airborne Soldier describing their experimentation experience with the TRV-150C

Driving Innovation in Realistic Training (DIRT Days) 24-01 (Clay County, WV)

The 44th Medical Brigade requested the TRV-150C TRUAS variant to support expeditious medical resupply operations by uncrewed autonomous aerial resupply vehicles. The experimentation involved classroom instructions on TRV-150C TRUAS variant operation and field experimentation scenarios. Once trained, Soldiers selected and loaded a payload on the aircraft and plotted a flight plan with limited contractor support. The aircraft and payload then departed and maneuvered to the designated landing zone. The experimentation scenario outlined the following three goals:

> Low altitude (<10ft above ground level (AGL)) air drops,
> Land and release payload for sensitive equipment, and
> Rapid mission planning and execution.

After delivering the payload, the aircraft returns to home base for further resupply.

U.S. Army National Guard photos by Edwin L. Wriston.

FY25 Expansion

Building on past successes, the collective focus for Fiscal Year 2025 (FY25) will continue prioritizing Soldier preparedness, mission readiness, and accelerated performance to construct a framework to guide the Army through tactical innovation.

The process will evolve through collaborative efforts that address technical challenges identified by Army units, then working through the necessary transition mechanisms to shorten the existing technology transfer timeline, avoiding the “valley of death” in defense innovation.

The long-term strategy remains constant - foster effective, integrated relationships that leverage the creativity of Soldiers, faculty, students, small businesses, and the Army science and technology community; and build a scalable methodology and toolset for collaboration between operational units and the Science and Technology (S&T) ecosystem toward Tactical Innovation.

Critical focus areas for the collaborative programs in FY25 include:

- Expansion to engage with military installations and academic partners in Alaska,
- Expansion to engage with military installations and academic partners in Kentucky,
- Deploy experimentation opportunities in collaboration with the United States European Command (EUCOM),
- Increase accessibility of the MINER for both CONUS and OCONUS tactical innovation opportunities, and
- Plan and execute DIRT Days for both CONUS and OCONUS tactical experimentation opportunities.

In FY24, the collective program accomplishments garnered regional, national, and trade media coverage in notable publications.

3ID Marne Innovation Visits University of Florida to Demo Vehicle Camo
MAEMomentum Magazine OCT 2023

A group of US Army personnel from the 3rd Infantry Division (3ID) traveled to Gainesville from Fort Stewart, Georgia, in February to interact with UF ME Capstone students, perform vehicle camouflage demonstrations, and discuss the collaboration between them, UF, and the Civil-Military Innovation Institute (CMI2).

To battle moldy barracks, Fort Stewart soldiers built their own mold detectors
Task and Purpose 06 OCT 2023

PFC Salem Ezz had just started working with a new Army innovation lab on Fort Stewart when his fellow soldiers returning from deployments began discovering black mold in their barracks.

Pfc. Salem Ezz, a former infantryman, was the lead coding engineer for a team of soldiers who developed a mold-detection system for barracks. Army photo by Sgt. Daniel Thompson, Facebook

Ezz shows the MCAT application's data collection for rooms in troop barracks.

Dragon's Lair IX
DVIDS 02 NOV 2023

Soldiers from the Marne Innovation Center won a national Dragon's Lair competition for a camo net invention. The Marne Innovation Center focuses on identifying and addressing Soldiers' needs, providing them with the tools and training necessary to tackle various issues, and allowing them to develop creative ways to enhance military gear, driven by real-world challenges they face on the battlefield.

Adm. John C. Aquilino, Commander, U.S. Indo-Pacific Command (USINDOPACOM) congratulates winners of Dragons Lair IX, in Honolulu, Hawaii, Nov. 2, 2023. The winners of Dragon's Lair received the meritorious service medal, a military school of their choosing, and the chance to implement their idea across the Department of Defense. Dragon's Lair is the Department of Defense's premiere innovation competition encouraging ideation from service members around the Department of Defense.

Dragon's Lair 9 champions announced
U.S. Army 06 NOV 2023

Army Capt. Chris Flournoy and Staff Sgt. Michael Holloway, both innovators from the 3rd Infantry Division's Marne Innovation Center, were selected as champions of Dragon's Lair 9 in Honolulu, Hawaii, on Nov. 2.

Adm. John C. Aquilino, Commander, U.S. Indo-Pacific Command (USINDOPACOM) stands with winners of Dragons Lair IX, in Honolulu, Hawaii, Nov. 2, 2023. The winners of Dragon's Lair received the meritorious service medal, a military school of... (U.S. Army photo by Spc. Casey Brumbach)

> "We're incredibly excited to win Dragon's Lair. We're looking forward to bringing the win back to the 3rd Infantry Division and continuing to pursue the advancement of this project."
>
> **Capt. Chris Flournoy, 3ID**

A problem-solving shop fosters 'culture of innovation' at Fort Stewart
Stripes 30 NOV 2023

FORT STEWART (Tribune News Service) — Sgt. 1st Class Nathan Lopez enlisted in the U.S. Army as a wide-eyed 17-year-old straight out of high school. An infantryman for nearly half his life now, he's comfortable with a top-down command structure where officers tell him what to do and how to do it.

Army Spc. Spencer Gasaway builds a custom hub cap mount at Marne Innovation Center on Fort Stewart, Ga., Apr. 20, 2023. (Jameson Harris/U.S. Army)

ALSO SEEN IN:
AJC Politics 20 NOV 2023

First Lt. Patrick Shea works near a plastic arm that is used for training soldiers how to apply a tourniquet to stop bleeding. Students from Georgia Tech worked with soldiers in the Marne Innovation Center at Fort Stewart to develop the arm. (AJC Photo/Stephen B. Morton) (Stephen B. Morton for The Atlanta Journal Constitution)

GTRI to Join Forces with 3ID for Third Annual Marne Innovation Workshop
Georgia Tech 03 JAN 2024

The Georgia Tech Research Institute (GTRI) marches into 2024 smartly with the Third Annual Marne Innovation Workshop, a collaborative event co-hosted with the 3rd Infantry Division (3ID) and the Georgia Tech Army ROTC. Set for Jan. 4 -7, this workshop has rapidly become a cornerstone event, fostering innovation and problem-solving at the intersection of military needs and technological advancements.

Army struggles to standardize innovation without stifling it
Army Times 09 FEB 2024

ATLANTA — For Capt. Chris Aliperti, January's "hackathon" — an annual innovation collaboration between the 3rd Infantry Division and Georgia Tech — felt like coming home.

Sgt. Connor Piegaro, a small unmanned aerial system master trainer with the 1st Battalion of the 4th Infantry Regiment, unfolds a TS-M800 II drone during Saber Junction 23 at the Joint Multinational Readiness Center near Hohenfels, Germany, Sept. 11, 2023. (1st Sgt. Michel Sauret/Army)

U.S. military barracks are in shambles. Will the government take action?
WBUR 09 FEB 2024

A recent report by the U.S. Government Accountability Office reveals poor living conditions inside military barracks – from mold and exposed sewage, to broken windows, nonexistent HVAC systems and more.

Poland strengthens friendship with Division during historic visit to Fort Stewart
U.S. Army 13 MAR 2024

FORT STEWART, GA. – Polish President Andrzej Duda got a close-up look at the 3rd Infantry Division's cutting-edge capabilities during a visit to Fort Stewart today. Part of a multi-day visit to the United States, the visit furthers the deep and abiding friendship between Polish and 3rd ID forces currently deployed to Europe.

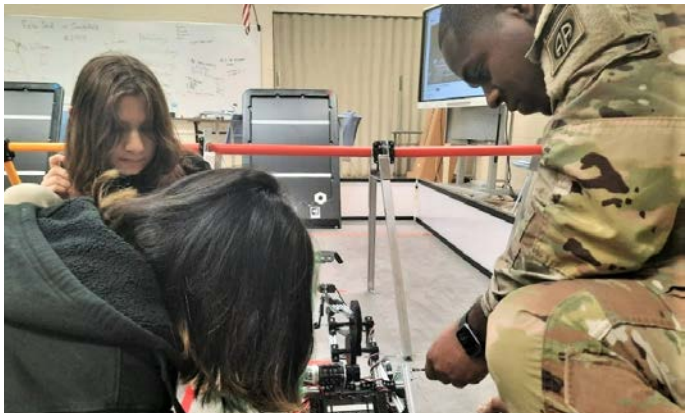
Polish President Andrzej Duda looks around the foyer of the 3rd Infantry Division (3ID) headquarters with U.S. Army Brig. Gen. Jeremy Wilson, 3ID's Deputy Commanding General of Maneuver at Fort Stewart, Georgia, March 13, 2024.

Polish President Andrzej Duda signs the guestbook during his visit to Fort Stewart, Georgia, March 13, 2024. Duda's visit included a live-fire demonstration of military capabilities and a meet and greet with 3rd Infantry Division Soldiers.... (Pfc. Rebeca Soria)

Polish President Andrzej Duda observes the National Anthem with U.S. Army Brig. Gen. Jeremy Wilson, 3rd Infantry Division's Deputy Commanding General of Maneuver at Fort Stewart, Georgia, March 13, 2024. (Pfc. Rebeca Soria)

Forging futures: Partnership between DoDEA and Airborne Innovation Lab
DVIDS 02 APR 2024

The partnership between Albritton Middle School and the Airborne Innovation Lab (AIL), both at Fort Liberty, North Carolina, is an outstanding example of how external resources can enhance education and inspire the next generation of leaders. As this collaboration continues to grow, it promises to keep offering invaluable experiences that prepare students academically and for future roles in Science, Technology, Electronics, Art, and Mathematics (STEAM) fields, whether civilian or military.



Courtesy Photo | Army 1st Lt. Terrence Allen mentors students on their robot design and operation at Albritton Middle School a Department of Defense Education Activity School at Fort Liberty, North Carolina. DoDEA operates as a field activity of the Office of the Secretary of Defense. It is responsible for planning, directing, coordinating, and managing pre-kindergarten through 12th-grade educational programs for the Department of Defense. DoDEA operates 160 accredited schools in 8 districts in 11 foreign countries, seven states, Guam, and Puerto Rico. DoDEA Americas operates 50 accredited schools across two districts, located on 16 military installations, including Army, Navy, Marine Corps, Air Force, and Coast Guard bases in seven states, Puerto Rico, and Cuba. Committed to excellence in education, DoDEA fosters well-rounded, lifelong learners, equipping them to succeed in a dynamic world.

10th Mountain Division Sustainment Brigade hosts Innovative Technology Symposium
Army 19 APR 2024

FORT DRUM, N.Y. — The 10th Mountain Division Sustainment Brigade hosted the Innovative Technology Symposium on April 15, 2024 to discuss how the Army is augmenting warfighting capabilities with emerging technologies.

> "The intent of this symposium is essentially for us to bring in some of the new technology to Fort Drum and highlight how we can work with different agency partners to get this into the hands of our Soldiers."
>
> **Chief Warrant Officer 2 Edilma Cruz, 10th Mountain Division**

BACH: EagleWerx ATIC, Where Innovation Meets Warfighters
Clarksville Online 06 MAY 2024

Fort Campbell hosts a unique Army unit that aims to interpret real-world problems into innovative solutions.

The EagleWerx Applied Tactical Innovation Center is the central point of connection for Warfighters and partners to learn, research, innovate, build, and explore new ideas to solve tactical problems. The ATIC provides the resources and network to empower Warfighter-centered innovation to increase readiness to win the future fight. (Justin Moeller, Blanchfield Army Community Hospital)

> Our workload is increasing every month. Innovation is a priority for all networks from the lowest ranking Private up to the Commanding General.
>
> **Staff Sgt. Austin Lehmann**

Tech-Tuesday Camo Ready
UF Innovate 15 MAY 2024

UF Innovate's Bethany Gaffey interviews Dr. Matthew Traum from the University of Florida's Department of Mechanical & Aerospace Engineering for the May 14 edition of Tech Tuesday for WCJB TV20. University of Florida seniors have been working with the U.S. Army to develop quick camouflage for military vehicles in the field.

Brian Kilmeade participates in Army drills at Fort Liberty
Fox News 21 MAY 2024

Brian Kilmeade checks out the newest U.S. Army warfare tactics and technology, including the DEVCOM ARL-developed TRV-150 from Fort Liberty, North Carolina.

A Review of the President's Fiscal Year 2025 Budget Request for the Army.
Senate Appropriations 21 MAY 2024

Catalyst-Pathfinder and the Accelerating FORCE programs were mentioned as success stories during the Senate Committee on Appropriations titled "A Review of the: President's Fiscal Year 2025 Budget Request for the Army." General Randy A. George was asked by Senator Shelley Moore Capito (R-WV) about the Army's plan to increase funding for Soldier-driven innovation programs.

See minute marker: 1:19 to 1:23.

Marne Innovation Takes Over the National Training Center

DVIDS 18 JUL 2024

The Marne Innovation Center is the central point of connection for Warfighters and partners to learn, research, innovate, build, and explore new ideas to solve tactical problems.

U.S. Army 1st Lt. Brenden Shutt, assigned to the Marne Innovation Center, 3rd Infantry Division (3rd ID), presents the Long Range Artillery Tactical Network, which allows leadership real-time visibility of dismounted Soldier movements, at the National Training Center, Fort Irwin, California, July 18, 2024. The Marne Innovation Center focuses on increasing efficiency through data and improving the capabilities of 3rd ID. (U.S. Army photo by Spc. Rebeca Soria)

Soldiers assigned to 5th Squadron, 7th Cavalry Regiment, 1st Armored Brigade Combat Team, 3rd Infantry Division (3rd ID), Marne Innovation Center, 3rd ID and Artificial Intelligence Integration Center, Army Futures Command, discuss a Tethered Unmanned Aircraft System with Sentinel Software at the National Training Center, Fort Irwin, California, July 18, 2024. By combining forces, the U.S. Army utilizes assets and creates technology to increase the lethality of its brigades, while also cultivating a culture of innovation. (U.S. Army photo by Spc. Rebeca Soria)

A Tethered Unmanned Aircraft System with Sentinel Software takes flight at the National Training Center, Fort Irwin, California, July 18, 2024. The U.S. Army utilizes technology that can increase lethality while also cultivating a culture of innovation. (U.S. Army photo by Spc. Rebeca Soria)

Montana Army National Guard brings mobile engineering lab to Fort Harrison
KTVH - Helena 08 AUG 2024

The Montana Army National Guard has become the first National Guard in the nation to bring a mobile engineering lab to its force.

Independent Record

Friday, August 9, 2024 — WHERE YOUR STORY LIVES — helenair.com

Helena refugee support group welcomes Congolese family

INDEPENDENT RECORD

A three-generation Congolese family makes a new home in Helena after 18 years in a Tanzanian refugee camp.

Their arrival comes through Helena Area Refugee Resettlement Team, or HARRT, which was founded in 2022 after Kabul, Afghanistan was captured by the Taliban just a year prior. The family of 10 marks 71 people rehomed by the volunteer team.

"Since inception, HARRT has successfully welcomed 10 families and two individuals – they are all now largely independent and living 'on the economy,'" treasurer Martin Finnegan said Wednesday in a press release. "Considering their starting point, and the level of resources we had, this is a remarkable achievement."

The Congolese family, which included a grandmother, mother, father and seven children, had escaped the civil war in the Democratic Republic of Congo in 2006. It stayed at the Nyarugusu Refugee Camp in Tanzania, which housed 150,000 people, but it wasn't a permanent solution.

Family members had to walk for water every day, and education for the children was limited. As refugees, the family wasn't allowed to leave the camp.

The family was granted asylum and vetted by the State Department, Homeland Security and the International Office of Migration, according to HARRT.

It had an extended family who'd made a home in Missoula, but Missoula's refugee landing didn't have the room, HARRT officials said.

"If Helena had not accepted them, they would have gone to the bottom of the list – meaning many more years in a refugee camp," the HARRT news release said.

HARRT plans to help the family find housing and the adults with work. It will offer English courses to the family, which speaks Swahili, and place the students in school.

"We have helped launch them," said Valerie Hellermann, executive director of HARRT.

Other refugees helped by HARRT have become working, independent adults, sometimes moving to other cities, HARRT reported.

HARRT has a location at 2712 Billings Ave. where refugees and immigrants are able to seek help.

Those interested in supporting HARRT can provide linens, welcome baskets, toys and financial donations. Volunteers are also welcome.

For more information, go to https://handsonglobal.org/project-harrt/

NATIONAL GUARD UNVEILS NEW RESOURCE TO SOLDIERS

SONNY TAPIA PHOTOS, INDEPENDENT RECORD

Montana National Guard Director of Joint Staff Brig. Gen. James Wilkins speaks Thursday at the ribbon-cutting ceremony for the MINER at Fort Harrison.

SONNY TAPIA
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The Montana Army National Guard and Fort Harrison plan to use its new tool to gain a greater connection between the community and service members.

A mobile immediate need engineering resource, MINER, was placed at Fort Harrison and will allow military members to turn engineering ideas into prototypes, officials said Thursday at a ribbon-cutting ceremony at the fort.

It holds multiple 3D printers and devices for soldiers to create new ideas and objects that may be used in the future on a battlefield or in communities.

"Soldiers have always had great ideas," said Tom Saltysiak, chief of technology

Civil-Military Innovation Institute, CMI2 which made the MINER, with MTANG, the first in the nation to receive the resource.

"We need to work on technology that will actually make a difference," Zenovy Wowczuk, founder of CMI2, said.

It will help military personnel be a part of the solution to issues because, according to Montana National Guard Director of Joint Staff Brig. Gen. James Wilkins, they have to identify problems faster and find solutions faster.

Wilkins mentioned the MINER allows for more recruiting capabilities because it is a mobile unit. It can be taken to college campuses in Montana and other public locations.

He said it will bring the community

Road closures, traffic expected in Bozeman for Trump rally

VICTORIA EAVIS
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Former President Donald Trump is set to hold a rally in support of Republican U.S. Senate candidate Tim Sheehy at the Brick Breeden Fieldhouse on Montana State University's campus Friday, which is likely to cause traffic and road closures nearby.

This will be Trump's first rally in the heart of Bozeman. His 2018 visit to the Gallatin Valley was held at the airport in Belgrade. The former president is slated to speak at 8 p.m., but doors open at 4 p.m. and road closures will begin around 1 p.m.

The local law enforcement agencies that are involved (Montana State University Police, Bozeman Police Department, Montana Highway Patrol and Bozeman Yellowstone International Airport Police, to name a few) have been mostly tight-lipped on what to expect around town and what security measures will be in place, but Gallatin County Sheriff Dan Springer said there will be a "significant" amount of security, including "over 100 law enforcement officers" across multiple local and state agencies not including the Secret Service.

This will be one of Trump's first rallies since the assassination attempt last month at a rally in Pennsylvania, and it

Please see CLOSURES, Page A2

MT poll: Sheehy and Tester locked in tight race; Harris improves Biden's numbers

VICTORIA EAVIS
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The latest poll in Montana's closely watched U.S. Senate race shows a tight contest with Republican Tim Sheehy

National Guard Unveils New Resource to Soldiers
Independent Record 08 AUG 2024

A mobile immediate need engineering resource, MINER, was placed at Fort Harrison and will allow military members to turn engineering ideas into prototypes, officials said Thursday at a ribbon-cutting ceremony at the fort.

ALSO SEEN IN:

KPAX-TV – Missoula & Western Montana

The Montana Standard

Ravalli Republic

Special Report: US Army innovation unit testing unmanned aerial, ground platforms
Janes 26 AUG 2024

As the US Army's top officials attempt to acquire
the latest in robotics, 3D printing, and radio networks, one unit is exploring how it might evolve existing capabilities to address soldier problems starting from the division level.

Dragons Duel at U.S. European Command innovation competition
European Command 17 SEP 2024

The U.S. European Command (USEUCOM) in Stuttgart, Germany, welcomed competitors for Dragon's Lair, an innovation competition where Soldiers from up and down the ranks got to pitch U.S. military leadership on potential breakthroughs in military technology. The gold medal went to Sgt. 1st Class Nathan Lopez, a former sniper from the 3ID and Marne Innovation Center, who proposed a more efficient system for deploying camouflage netting over vehicles.

U.S. Army Sgt. 1st Class Nathan Lopez, a former sniper who proposed a more efficient system for deploying camouflage netting over vehicles, was the gold metalist in the recent Dragons Lair X, and innovation competition where U.S. military leadership on potential breakthroughs in military technology.

> "This is kind of how we plant the seeds, and then we build an ecosystem around them to help them grow."
>
> **U.S. Army Brig. Gen. John Cogbill**

Northern Strike 24-2 Facilitates Advancements in Front Line Logistics and Combat Care
DVIDS 20 SEP 2024

In a small grassy clearing nestled into the seemingly infinite pine forest of northern Michigan, the Commander of the 437th Medical Company Ground Ambulance watches on as his combat medics load into their ambulances and rush off to provide care after receiving a 9-Line MEDEVAC request. As the last ambulance pulls out, the mist which has soaked the field all morning turns to a heavy rain. The medics who remain on the site move into the command post tent to avoid the weather and wait for the field litter ambulances, or FLAs, to return.

Photo By Maj. Megan Breen | 437th Medical Company Ground Ambulance conducts casualty care at Camp Grayling, Michigan during Northern Strike 24-2. Northern Strike 24-2, one of the Department of Defense's largest reserve component readiness exercises, is scheduled to take place at Michigan's National All Domain Warfighting Center (NADWC) from August 3-17, 2024. Over 6,300 participants from 32 states and territories and several international participants will converge at the NADWC. Northern Strike is the premier reserve component training event designed to build readiness with joint and partner forces in all domains of warfare. (U.S. Army National Guard photo by Maj. Megan Breen)

Hate setting up camo netting? Try this new soldier-built invention.
Army Times 23 SEP 2024

Despite the pricey, high-tech advances of today's Army, an old-school field task — assembling camouflage netting and poles to hide vehicles — remains part of the drudgery of a soldier's life.

Army Innovation: Soldiers at Fort Stewart Drive Change for Modern Warfare
WJCL.com 12 OCT 2024

FORT STEWART, Ga. —
In the ever-evolving landscape of warfare, the U.S. Army is turning to its own soldiers for innovative solutions. At the Marne Innovation Center, troops are developing creative ways to enhance military gear, driven by real-world challenges they face on the battlefield.

ARCENT Opens First of its Kind Innovation and Manufacturing Center in Kuwait
U.S. Army 17 OCT 2024

CAMP ARIFJAN, Kuwait – U.S. Army Central opened the new ARCENT Innovation and Manufacturing Center, or AIM-C, on Camp Arifjan, Kuwait 27 September, 2024.

U.S. Army Staff Sgt. Allen Kemper, ARCENT Innovation and Manufacturing Center (AIM-C) NCOIC, welds metal pipes at the AIM-C in the U.S. Central Command area of responsibility. (U.S. Army photo by Sgt. Brandon Hernandez) (Photo Credit: Sgt. Brandon Hernandez)

Technology Featured in the Wolverine Guard
Wolverine National Guard 4-2024
Wolverine Guard, a Michigan Army and Air National Guard quarterly publication, featured the TRV-150 and Northern Strike exercise.

Glossary

5G	Fifth Generation
AAL	Additional Authorized List
ABN DIV	Airborne Division
A-CDD	Abbreviated Capability Development Document
ADSR-SN	Advanced Dynamic Spectrum Reconnaissance-Sensor Network
ADvM DR	Advanced Manufacturing Digital Repository
AEF	Adaptive Experimentation Facility
AFC	Army Futures Command
AG	Assistant Gunner
AI	Artificial Intelligence
AIL	Airborne Innovation Lab
AMPV	Armored Multi-Purpose Vehicle
AOR	area of responsibility
ARL	Army Research Lab
ARSOAC	Army Special Operations Aviation Command
ARTC	Arctic Regions Test Center
ATAK	Android Tactical Assault Kit
ATIC	Applied Tactical Innovation Center
BCT	Brigade Combat Team
BSB	Brigade Support Battalion
BSC	Base Supply Stores
BWT	by, with, and through
CAD	computer-aided design
CASEVAC	casualty evacuation
CENTCOM	Central Command
CMI2	Civil-Military Innovation Institute
CRO	Combat Rescue Officer
DAP	Direct Action Penetrator
DEVCOM	U.S. Combat Capabilities Development Command
DIRT Lab	Design, Innovation, Research, and Technology
DOD	U.S. Department of Defense
DOOR	DAP Operational Optimization Resolution
DV	distinguished visitors
ECW	Extreme Cold Weather
FFRE	Future Force Requirements Experimentation
FORCE	Future Operational Requirements, Capabilities, and Experimentation
FSC	Forward Support Company
GHz	gigahertz
GPC	Government Purchase Card
IBCT	Infantry Brigade Combat Team
IFQ	Initial Flight Qualification
ISR	Intelligence Surveillance and Reconnaissance

JMRC	Joint Multinational Readiness Center
JPMRC	Joint Pacific Multinational Readiness Center
JRTC	Joint Readiness Training Center
JTAARS	Joint Tactical Autonomous Aerial Resupply System
Km	kilometer
LCI	Lions Club Industry
MANET	Mobile Ad-hoc Network
MCAT	Mold Condition Awareness Tool
MCIM	Mission Command Integration Module
MCO	multi-channel operations
MINER	Mobile Immediate Need Engineering Resource
MISIL	Mountain Innovation System Integration Lab
MIST	Mountain Innovation Simulation and Technology
ML	Machine Learning
MMG	Medium Machine Gun
MOLLE	Modular Lightweight Load-carrying Equipment
MOS	Military occupational speciality
MSI	musculoskeletal injuries
MSV	Modular Scalable Vest
MT	Master Trainer
NDAA	National Defense Authorization Act
NetModX	Network Modernization Exercise
NGSW-AR	Next Generation Squad Weapon (NGSW) – Automatic Rifle
NSN	National Stock Number
OCONUS	outside the continental U.S.
OPFOR	opposition force
PEO	Program Executive Office
PIR	Parachute Infantry Regiment
PMCS	Preventative Checks and Maintenance and Services
PM E2S2	Project Manager Expeditionary Energy and Sustainment Systems
PM TR	Project Manager Tactical Radio
PM UAS	Project Manager – Uncrewed Aircraft System
POLAR-SHOTS	Projects for Operations in Locations of Arctic Response – Skis for Howitzer Over the Snow
POLAR-TRIP	POLAR-Touchscreen Reliability Improvement Project
POR	Program of Record
PWIC	Pathfinder Warfighter Innovation Chiefs
R2D2	Reconnaissance Reporting Distributed Drone
RETRANS	Retransmission
RFP	Request for Proposal
RR	Ranger Regiment
S-CDID	Sustainment Capability Development Integration Directorate
SFG	Special Forces Group
SOAR	Special Operations Aviation Regiment
SOTF-L	Special Operations Task Force- Levant

SpEX	Spectrum Exchange
SpOAR	Spectrum Orchestration Automation and Response
SRR	short-range reconnaissance
sUAS	small uncrewed aerial system
TORCH	Tactical Operations Related to Cybersecurity Hub
TRACA	Translational Research Ad¬vanced Capability Acceleration
TRADOC	training and doctrine
TRUAS	Tactical Resupply UAS
TRV-150C	Tactical Resupply Vehicle
TLS	Tailored Logistics System
TSM	Tactical Scalable MANET
ULCANS	Ultra-Lightweight Camouflage Net System
USARC	U.S. Army Reserve Command
USASOC	U.S. Army Special Operations Command
USSOF	United States Special Operations Forces
VHA	variable height antenna
VICS	Vehicle Integrated Camo System

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