



THE QUARTERLY GRANITE

3Q22

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BEDROCK INTERNS



CAPT SCOTT RIDER
UNIT: 9AS

INVENTORY TRACKING SYSTEM

Capt Rider is a C-5M pilot from the 9AS. His main focus will be to streamline squadron inventory tracking and management, as well as create an easy-to-use guide to aid C-5 crews operating at unfamiliar and infrequent airfields.



SSGT BEN NEWSOME
UNIT: 436MXS

FORCE TECH NUTPLATE TOOL

SSgt Newsome has redesigned a set of “snap pliers” for the removal of a retaining clip on the Force Tech Nutplate; prior to this innovation, there was no designated tool for this. With this customized tool, work time has been slashed by almost 200%.



SRA MATTHEW BENNETT
UNIT: 436AMXS

AERPS PRESSURE TESTING PLUG

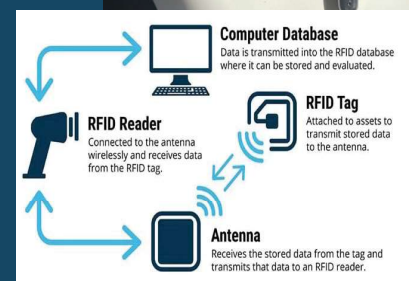
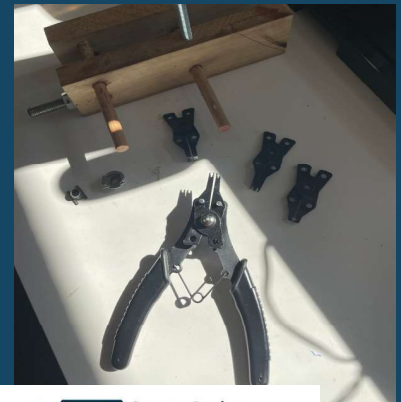
SrA Bennet is developing a system to allow maintainers to have easier access to their tools with an RFID check-out program; this program will greatly reduce time needed to check out tools, and aid in tracking tools that appear lost so that recovery can occur faster.

STAFF SPOTLIGHT



SA WENDY LATHROM

SA Wendy Lathrom joins Bedrock after two years as the commander of the OSI Det 306 and brings a wealth of investigative experience to the team. Her educational background includes a Bachelor’s of Science in Political Science and certification as a Federal Criminal Investigator. Her goal at Bedrock is to focus on process improvement and project management, specifically through development of workflow tools accessible via web and mobile applications.



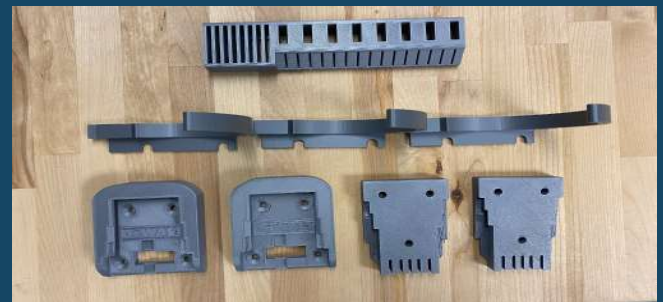
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INNOVATOR OF THE QUARTER

TSGT TIMOTHY RESZEL 736TH AIRCRAFT MAINTENANCE SQUADRON

Leading the print farm initiative at 736AMXS, TSgt Reszel is using 3D printing and prototyping to tackle problems at the flight level. With the constant push to do more with less, TSgt Reszel and the Print Farm hope to alleviate the cost burden of solution finding by creating and prototyping their own solutions. By fabricating their own parts for support equipment, they are able to tackle problems that would otherwise hinder mission completion.

With first-hand knowledge of the 736AMXS workflow, TSgt Reszel and his team are able to create organization solutions that are specifically designed for the mission set, clearing the workspace for streamlined function, and ensuring that risk items, like hazardous storage, are clearly and accurately organized. Some of their ongoing projects include Dewalt hangers and mounts, small part holders for hazardous storage, and replacement wheels and handles for pelican cases.

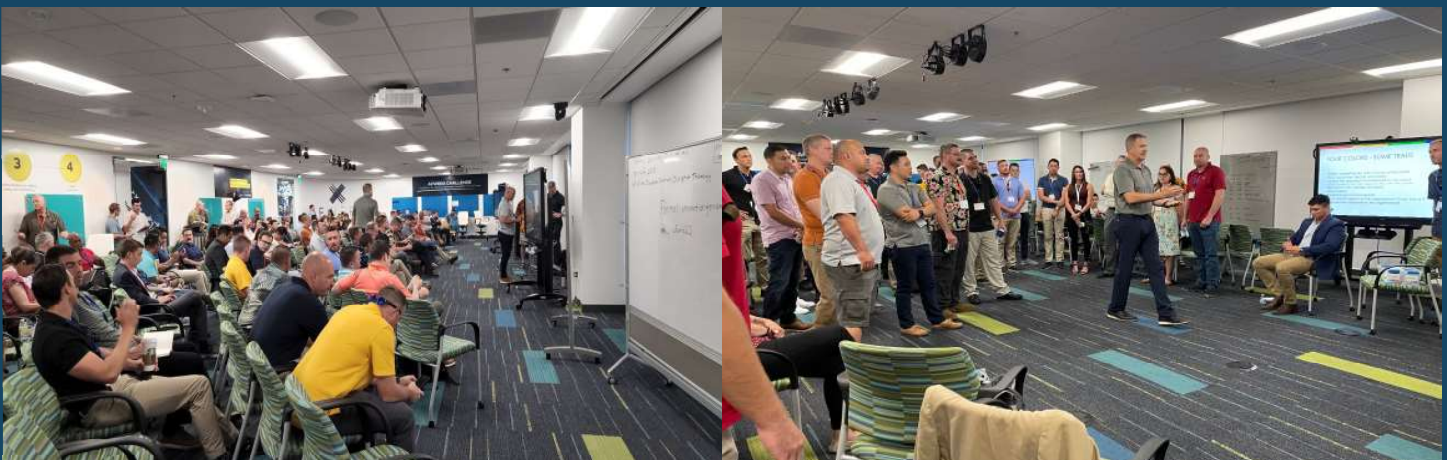


AFWERX SPARK SUMMIT



The AFWERX Spark Summit 2022, held in Las Vegas, was a great opportunity to catch the latest developments in the innovation eco-system from mission partners across the DoD & industry.

Bedrock Innovation Lab was able to send several members of the cadre, and were able to get valuable networking opportunities, and meet key individuals in the innovation space for future innovation efforts. Among others, Bedrock Innovation Lab was able to develop relationships with Design Warfare, DVP/Shift, VISION, Project Morpheus, and JFWORX. As always, Bedrock looks forward to participating in future Spark Summits, and hosting our own!





AMERICA'S AIR & SPACE FORCES YESTERDAY, TODAY, & TOMORROW 75 YEARS IN THE DEFENSE OF OUR NATION

By Lt Peron

This year's AFA Air, Space and Cyber Conference boasted one of the largest attendance rates of any conference past. As the leading professional development event for Air Force and Space Force officers, enlisted members, civilians, veterans and defense industry leaders and representatives, this conference brought together top Air Force and Space Force leadership, industry experts and government officials to discuss the challenges facing the aerospace and cyber communities today and in the future. Highlighting innovation and change, Air Force Chief of Staff Gen CQ Brown Jr. Focused on the need for the Total Force to "accelerate change" and reshape the service to meet pacing modern-day threats that are fundamentally different than those of the previous 30 years. In his key note address, Gen Brown told the audience "we have done this before and we can do it again," and urged the audience that the force has historically proven capable to rise above any challenge, and will be capable to do so in the future, especially if we fuel our efforts "through experimentation, rapid prototyping, adapting new ideas, and having a bias for action, risk-taking, and creative disruption across all levels of Airmen", as we have done in the past.

Innovation and empowerment were a key themes throughout the conference, especially focusing on ensuring Airmen are professionally fulfilled, and have the quality of life and ability to accomplish their missions and dedicate themselves to innovative ideas. Dover AFB and Bedrock were lucky enough to have one of our own airmen, SrA Jett Spaulding, brief the Vice Chief of Staff, Gen. David W. Allvin, on the innovation efforts at Dover AFB, and his specific projects focusing on digital environments and their usages to modernize training.

In a blunt speech entitled "The Mobility Manifesto", Gen Mike Minihan presented his case for the state of air mobility - the joint force is not as ready as it thinks it is, and the time to act is now. As he states, there is an inherent need to move quickly, rapidly prepare, and investing in extracting maximum value out of both our existing capabilities and innovations to address gaps across communication, survivability and agility. "When he says accelerate change or lose, we say we win or die."



"We must harness any innovation that can put meaningful capability in the hands of warfighters. We can't let 'perfect' be the enemy of 'good enough.'" - Gen Brown



"Our competitors are deterred from aggression not just by weapons systems, but more importantly by a motivated, professional, empowered, and well-trained Joint Force." - Secretary Kendall



"Nobody is going to care what our plans are for five to 10 years if we lose tomorrow. Our toys, our training, our desires are meaningless unless we maneuver them to unfair advantage and unrepentant lethality." - Gen Minihan

SURGEON GENERAL'S VISIT



On September 20, 2022, Bedrock Innovation Lab was proud to host a lunch and learn, as well as a tour for Col. Rudolph Cachuela, Air Mobility Command Surgeon General, and CMSgt James Woods, Air Mobility Command Chief of the Medical Enlisted Force. During his visit, Col. Cachuela spoke with 436th Medical Group staff and toured the 436th MDG, Air Force Mortuary Affairs Operations and Bedrock Innovation Lab.



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REAL WORLD INNOVATION

3D PRINTED FINS FOR ANTI-TANK GRENADES

In another show of real world innovation in real time, Ukrainian fighters have found another use for 3D printers in the continuing conflict with Russia. Though they have what are generally considered “outdated” grenades, Aerorozidka has developed both an Ukrainian-made octocopter outfitted with a two-bomblet payload. The two-bomblet payload consists of Soviet-era RKG-3 anti-tank grenades with 3D-printed tail fins, used to stabilize their fall from drones. The RKG-3 was originally designed in 1950, and designed to be thrown by hand at enemy armored vehicles – with quick thinking and military innovation, Ukrainian forces have been able to adapt this weaponry to remarkable effectiveness at destroying Russian tanks and armored vehicles.



3D PRINTING TO SUPPORT SATELLITES



As 3D printing has grown in popularity throughout a variety of industries, the space industry has found innovative ways of using this technology in particularly beneficial ways for the aerospace mission set. Since 2014, astronauts have been able to use 3D printers in space to make goods whenever necessary, instead of relying on shipments from earth. A recent NASA assessment estimates that a 3D printer could manufacture roughly 30% of all necessary parts aboard the ISS, and could even use the printers to build small satellites, known as CubeSats, onboard the space station, rather than launch them from earth. Though there is much more work to be done in order to effectively print components that can resist the stresses of space flight, 3D printing is an exciting evolution for the aerospace industry, and can even likely play a key role in the future of space travel.

3D PRINTER DRONE SWARMS

Researchers have recently announced their proof-of-concept success in testing a system using swarms of drones as flying 3D printers of materials in the construction and repair of buildings, a system inspired by the techniques used by bees and wasps to assemble their nests. Using the drone swarm makes 3D printing technology mobile, and allows the UAVs to operate autonomously following pre-planned flight profiles and schedules, while also maintaining the capability to adapt to the evolving construction process. Known as Aerial Additive Manufacturing, the use of 3D printing drone swarms as construction assets could transform the way construction is performed on tall buildings, hazardous work sites, and potentially dangerous structures.



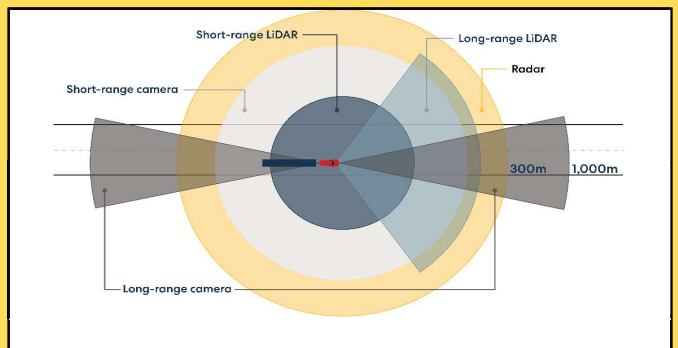
SMALL BUSINESS INNOVATION RESEARCH

KODIAK VIRTUAL FLIGHTLINE TESTING ENVIRONMENT

Bedrock's SBIR Phase II with Kodiak Robotics on Autonomous Flightline Vehicle testing has recently concluded, and we are proud of the technological advancements this phase has brought about. Phase II focused on adapting Kodiak's software stack to the flightline, testing it in simulation and prioritizing vehicles for automation. Kodiak concentrated on building and testing an Autonomous Flightline Vehicle (AFV) on a simulated Dover flightline, developed in Applied Intuition's simulation platform - the power of this tool lies in the simulated vehicle not knowing it is running in a simulation!

Additionally, Kodiak, working with the 436APS, developed a comprehensive scenario "library" for a flightline vehicle, with four main categories of scenarios: baseline driving, pedestrians, aircraft scenarios, and edge cases. Through the simulation, Kodiak was able to test Adaptive Cruise Control, the utility of high-fidelity sensors and LIDAR point clouds, yielding to pedestrians, entering and exiting the parking bay via Entry Control Points (ECPs), and passing key zones.

Their long-term vision is to develop autonomous technology that can free up Airmen at Dover, and beyond. The next steps for this project are likely to focus on the development of autonomous PAX vehicles and AGE bobtails, with the hopes of partnership with Dover AFB on a STRATFI application.



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PROJECTS

ATC TOWER AC DEFLECTOR

PROBLEM:

The ATC Tower does not have a vent system that allows for the deflection or manipulation of the air flow, and currently, the air only flows upward and does not provide comfortable cooling in the summer, nor comfortable heating in the winter; additionally, the winter weather causes the windows to fog up in certain areas, with no way to remove it

SOLUTION:

The ATC Tower Deflectors, designed by SSgt Newsome, allows for angled air flow in the summer and winter that will be directed more toward the center of the room where the employees can feel it, and are also able to be flipped to be directed at the windows in the winter, to allow for proper de-fogging.



VACUUM GENERATOR SILENCER

PROBLEM:

Vacuum generators are what Aircraft Structural Maintenance use to create even pressure on a bond that is applied to the aircraft. During usage, the air vacuum generator creates an uncomfortably loud noise, creating the possibility for ear damage.

SOLUTION:

The silencer prototype, which is currently in the initial testing phase, is inspired by the current shop practice of muffling the generator using various materials. The current prototype has reduced the noise generated by at least 2/3rds.



DUAL RETRACTABLE UTILITY KNIFE

PROBLEM:

With a variety of needs for fiberglass strips and patches, there is not a dedicated tool to be able to easily and accurately cut fiberglass for a variety of repairs.

SOLUTION:

This tool, in the prototype phase, will allow quick width adjustments and will obtain perfect parallel cuts; this will allow Structural Maintenance to cut long strips of impregnated fiberglass for panels such as the bonded fiberglass wing root panels on the C-5 that are constantly needing repairs due to elongated holes and delaminations. This tool will also make for quick removal of delaminated areas, due to its ability to make quick square, rectangular and even circular cuts. The tool also collapses as a normal utility knife does to hide the blade for safety.



INAUGURAL SUAS FLIGHT

Dover AFB was proud to be able to have it's first SUAS flight on September 26, 2022. After 2 years of work and effort, Dover AFB's SUAS Program was able to get a AAA (Airspace Access Approval) from AFSOC/A3OU. Using the Skydio, amongst other platforms, Dover AFB hopes to provide safe and effective integration of SUAS capability on base in order to support a variety of mission sets, to include Aircraft MX inspections, C-SUAS, Airfield Inspections, ACE TTP development, and PA aerial documentation and content development.

The screenshot shows the Defense Internet NOTAM Service (DINS) interface. At the top, there are logos for the Department of Defense and the DINS logo, which includes the text "DEFENSE", "AIR FORCE", "ARMY", "NAVY", and "MARINE CORPS". Below the logos, there are navigation buttons: "Display/Print Selected NOTA", "Print all NOTAMs", "Save all NOTAMs", "Check all NOTAMs", and "Uncheck all NOTAMs". There are also fields for "Sort By: Default Report" and "Keyword Sort". The "Locations:" section lists "KDOV". The "Data Current as of:" is "Mon, 26 Sep 2022 17:59:00 GMT". The "KDOV_DOVER AFB" section lists three NOTAMs:

- M1496/22 - SUAS OPERATIONS IN EFFECT BELOW 50' AT DOV300001, 26 SEP 17:30 2022 UNTIL 26 SEP 18:00 2022. CREATED: 26 SEP 17:30 2022
- M1488/22 - TWY F LIMITED TO AERO CLUB AIRCRAFT ONLY DUE TO TWY SHOULDER WORK IN PROGRESS, 26 SEP 11:30 2022 UNTIL 28 SEP 21:00 2022. CREATED: 20 SEP 15:29 2022
- M1487/22 - TWY E CLSD FROM TWY F, 26 SEP 11:30 2022 UNTIL 28 SEP 21:00 2022. CREATED: 20



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RESOURCES

AVOLVE

Avolve is a content sharing platform for all Air, Space and military professionals to explore and view a variety of resources and learning paths for their training, education and self-improvement. Content can be contributed by anyone who wishes to share their expertise or interests with other Air, Space and military professionals. Since this is hosted on PlatformOne, this is accessible on any device!



“Avolve: A place to Evolve, a place to become Involved, a place where content Revolves around you!”



LIBBY

The DOD MWR Digital Libraries, now supported by Libby, delivers free, online resources to service members and families. Using the Libby app, you can access e-books, audiobooks, and movies for free, 24/7. Further, using the DOD MWR libraries, you can access academic support, like test prep material for the AFOQT, professional development, career transition and a vast array of learning resources, like Mango Language, and online content for all ages and interests.

Select DOD MWR E-Library to set up an account. When setting up your Libby account, find “Department of Defense” in your library list, and choose “DOD MWR Libraries” from the list of locations - you will be redirected to the authentication page, where you will sign in with your DoD ID and birthdate.

Happy reading (or listening)!

PODCASTS

BEDROCK INTERN PROGRAM

Want to know what it's like to work at Bedrock? Maj Nik Martini sits down with Bedrock's most recent internship graduates, SSgt Carli Meis (436OSS) and SrA Jett Spaulding (436AMXS), discussing the opportunities, the venue, how to apply, and the skills you'd learn by working at Dover AFB's spark lab!



POW AND VIETNAM VETERAN RALPH GALATI

On this episode of the Bedrock Podcast, we have Mr. Ralph Galati in the studio with us. He was an F-4 Weapons Officer who was shot down over North Vietnam in February of 1972. He spent the next 14 months as a Prisoner of War. He talks on his experiences during captivity and his return home.



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