

OPERATIONS AND MISSION SUPPORT

BLUF TITLE	BLUF STATEMENT
Autonomous Giant Vertical Takeoff and Landing Robotic Platforms	Aerial Vehicle Automation builds giant vertical takeoff and landing robotic drone platforms that make 1500 lbs+ of thrust. These autonomous flying robots are designed to carry anything 200+ lbs over 300 miles. They can reach remote areas without the need for road or runway. Operating costs are 1/10th that of traditional helicopters. Transformative applications include transport of supplies, reconnaissance, remote medivac, defense and several other exciting applications that are under wraps for now.
Holoportation	Aexa Aerospace provides creative solutions for training and operational support using mixed reality, augmented reality, and virtual reality through Holowizard. Holographic teleportation (holoportation) is an augmented reality (AR) training application. Users receive three-dimensional instruction from someone off-site whose image is projected through the lens via a hologram. For example, the application can allow for an engineer to simulate a "walk" through a space station, or for a doctor to "appear" in a patient's home.
Alyss Analytics - Soft skill metrics from 60 seconds of video.	Alyss is a machine learning, video analytics AI technology using video content, images, and audio waves to measure individual emotions, soft skills, and attributes which can be tracked and referenced over time to support strategic planning. The long-term benefit of Alyss is the ability to harness its predictive power thereby preserving and strengthening the human capital edge of the US military.
Building Autonomous Flight Platforms for use in The NAS (National Air Space	American Space Industries (ASI) has entered a Technology Partnership under a Space Act Agreement (SAA) with the National Aeronautics and Space Administration (NASA) to manufacture the SIERRA UAS Platform (Unmanned Aerial System). The ASI partnership with the Airborne Science Division of The Ames Research Center will provide engineering support to ASI along with mission support, as ASI builds a fleet of 10 aircraft to be deployed for Statewide and U.S Earth Resources missions (flights). The ASI-NASA Partnership will also provide a STEM and AERONAUTICS Curriculum to the State Colleges that will allow students to interact with and create Earth Resource Missions in Conjunction with ASI, NASA and State Colleges, learning valuable Earth Sciences Mission and Flight skills.
Secure cellular network in a backpack	Multi frequency, undetectable complete cellular network with in backpack

Versatile Three Degree of Freedom Motor/Joint	This spherical motor replaces three motors with one motor that performs all degrees of freedom. The rotor and stator can also separate and reattach to other stators or rotors at different locations. These could be on the original robot, on other robots, or even on stationary points. Many robots can transform into fewer robots or into a physical structure.
OnePager	OnePager software is used by project management organizations worldwide to create standardized timeline reports while saving time, money, and frustration. The software converts tabular project data from Microsoft Project or Excel into Gantt charts that are easy to customize, standardize, and share. If your organization manages large-scale projects, OnePager is a must have. Never build a Gantt chart by hand again!
Clusiv, Technology Driving Inclusion	Clusiv is the creator of the world's first e-learning and accessible onboarding platform built for and by blind and visually impaired people. Clusiv improves employment outcomes for government agencies, enables organizations of all sizes to hire & train blind and visually impaired people for positions they never could have prior, and gives the blind community access to the digital age of technical and remote jobs at scale for the first time in history.
Structural Concrete Mix for Construction for Electromagnetic Wave/Pulse Shielding	The conductive concrete technology addresses the national security needs for shielding electromagnetic pulses (EMP). An enclosure can provide shielding at frequencies from 10 kHz to 18 GHz. The construction cost is about 10% that of a Faraday cage or a shelter constructed with metal panels, which require high maintenance costs. Conductive concrete shelter is maintenance-free. The test results of a full-size conductive concrete shelter have shown 100~120 dB of shielding effectiveness. Conductive concrete can secure EM waveforms from C4ISR facilities. It is about twice as strong as normal concrete and is durable with a service life of 35 years.
Lift Nacelle	Copperhead Aeronautics is developing rotor replacement technology, referred to as a Lift Nacelle, for both drones and helicopters. By focusing on energy efficiency and elimination of moving parts Lift Nacelles can improve aircraft fuel consumption and reduce maintenance costs, while improving the aircraft top speed, operational range, and maximum payload.
Portable, non-lethal, vehicle stopping barrier	The Cowboy Barrier protects personnel and facilities from rogue vehicles. Any vehicle, intentionally or accidentally, with only a foot on the accelerator, can be turned into a lethal weapon against your personnel or your facility. The Cowboy Barrier stands between weaponized vehicles and your people. The barrier is a non-lethal system that stops vehicles before they can inflict damage. It's portable, quick to set up and tear down, requires no maintenance, no electricity. Since the barrier does not physically attach to a surface, installation, use or removal does not damage or alter the street or road.

Alternative Access Split Platform Utility Trailer	Crafty Cart is a revolutionary, patent pending, utility trailer which is designed to deliver goods and services to location in a compact, fuel-efficient design. Once on-site Crafty Cart opens to surround the user with the wares and tools needed to complete the job. Crafty Cart can go where comparable vehicles can't go because of their limited flexibility to deliver only to areas that can accommodate their size and rigid form. While initially designed for food and beverage service, Crafty Cart's design makes in an ideal tool for service providers, vendors, and as a platform for various military applications.
XTRU: Cost Effective Readiness for the DOD	Combat damage is difficult to predict, making in-theater spare parts inventory management difficult and costly. These repair parts also require large and expensive tools or fixtures, making supply chain logistics complex. Field-able XTRU is a digital-thread driven suite of tool-free forming and machining technologies, packaged as an integrated solution, which enables organic manufacturing of airframe components. This results in increased asset availability and simplified supply chain logistics, enabling cost effective readiness for the DOD.
Small and medium duty commercial hovercraft	Hov Pod operate off-road and amphibiously over mud, riverbeds, shallow water/tidal regions, flooded land, rapids, shingle beaches, open water, grass, sand, desert, swamps, marshland, prairie, wetland, meadow, bogs, bayou, shore, weeds, submerged plants, snow, ice, shallow lakes, dried up salt marshes, rice paddy, sandbanks, roads, indeed any flat surface. Hov Pod leave no footprint on wild life or ecology. Hov Pod come in unique sizes, including a model that can carry up to 9 people or haul a 1500 lb (680 Kg) payload to a remote destination, flying at speeds up to 45 mph. Hov Pod solutions get first responders close to survivors during a disaster, move from water to land, survey remote areas, swarm an island, search a perimeter 24/7, engage insurgents at the border, ferry passengers, land on the beach or provide a unique adventure experience to unexplored boundaries.
Full Length Overhead Cargo Rack System for UTV's	This heavy-duty full-length overhead cargo rack provides additional space on a UTV to carry long or bulky items such as posts, shovels, ladders, saws, lumber and pipe. This rack also provides the driver and passenger with heavy duty overhead protection from falling objects. Available accessories: 1) side cargo baskets to haul items such as buckets, supplies and smaller hand tools. 2) Wire spooling adapter. 3) Manual strap winch that can be used to lift heavy items into the bed of the vehicle and secure overhead loads.

X-VAP Portable Self-Contained Solar Desalination	Katz Water Technologies will use solar desalination to provide sustainable sources of purified water. This water can meet the DOD mission needs for drinking, training, weapons testing, fire suppression, and sanitation. The technology is a patented heat exchanger which can perform the entire water purification process within one small, modular, and inexpensive piece of equipment. Using exclusively solar power, remote forward deployments would have access to freshwater in areas without reliable power or thermal energy source. The system is designed to be easily transported by standard military vehicles and could be deployed anywhere with a previously unusable water source like seawater, contaminated lakes, and streams, or compromised well water.
Shadow Tool Staging Systems	Shadow Tool Staging Systems introduce an ingenious, patented advancement for quick hand tool use and simple tool inventory control vs. the century-old toolbox design. Shadow Systems openly display tools for constant physical and visual access, creating an efficient tool-use environment. Unsurpassed ergonomic mobility allows repair wherever needed. All power and electronic devices are also supported. Shadow's dedicated tool positions aide tool selection and return, while providing simple intuitive tool inventory control. Mechanics instantly see if a tool is missing, eliminate FOD damage to assets, saving millions to our taxpayers, or more importantly saving military personnel injury and/or lives.
Nov8tive Air Products	<p>Our product line consist of the MP2 Multi-Port Shutoff Valve and the Eco-Reveal Brand of Heating, Air-conditioning, and Refrigeration Equipment and related HVACR Products.</p> <p>(A) The Patented MP2 Multi-Port Shutoff Valve is a simple device, which provides isolation control of the four main components of the refrigeration circuit, ie; Evaporator, Condenser, Liquid Line, and Suction Line for refrigerant leak detection.</p> <p>(B) The Eco-Reveal Brand of Air-conditioning and Refrigeration Equipment features the MP2 Multi-Port Shutoff Valve, which allows our brand to have in place an accurate and timesaving means of refrigerant leak detection. Our brand is the only brand on the market that features this eco-friendly capability.</p>
MindMilitary	MindMilitary improves the performance of commanding officers, soldiers and employees through the use of mindfulness and meditation practices. We will be copying the format of our already existing and scalable technology MindSport. Benefits for soldiers, commanding officers, and DoD employees include improved reflexes and performance, improved memory and concentration, ability to retain information longer, reduced stress, increased emotional quotient (EQ), among many other benefits.
Selective, Safe and Low Cost Asian Carp Pesticide	Army Corps of Engineers (ACE) responsibility includes helping to control the invasive Asian carp inhabiting most of the Mississippi Basin and threatening the Great Lakes. These fish endanger the environment, recreation and commerce. MJSTI proved a selective, safe and low cost carp pesticide. The pesticide meets the 2018 BAA E-13 technology request (ERDC, ACE Research Center).

<p>Heavy lift unmanned aerial vehicles</p>	<p>Mobile Recon Systems manufactures a family of multi-rotor, vertical take-off UAVs, with industry leading lift capacity, functional flexibility, and flight time. We provide lift capacities of 190 pounds (and growing to over 1,000), extended ranges with flight times of up to 3 hours with multiple fuel sources, and the ability to use and change out up to 10 sensors at a time.</p> <p>Our UAVs are a force multiplier, supporting the warfighter at all points of their service. We enable high volume, long-range supply of food, medical supplies and munitions, including “last mile”, without endangering personnel. Our UAVs also support airborne triage, retrieval of injured individuals from hazardous environments, ship-to-ship and shore-to-ship transport with water take off and landing, high altitude operations, long-range inspections, and border patrol. We are on a path to be Made in USA of nearly 100% assured electronics in 6-12 months.</p>
<p>Aerial Vehicle Autonomous Anchoring System (AVAAS)</p>	<p>The Aerial Vehicle Autonomous Anchoring System (AVAAS) technology automatically and autonomously anchors Vertical-Take-off-and-Landing (VTOL) Aerial Vehicles (AVs) to helipads/vertiports just after landing, and automatically and autonomously un-anchors the said AVs just prior to take-off. It also automatically and autonomously connects grid power to AVs upon landing, and automatically and autonomously disconnects grid power upon take-off. The AVAAS technology facilitates safe and reliable loading/unloading of cargo and passengers, keeps AVs from moving or blowing off elevated helipads/vertiports in high winds, provides grid power when parked, reduces manual tasks, and reduces risk of injury/death to personnel and damage to property/equipment.</p>

<p>Autonomous D2D Payload Transfer</p>	<p>Embracing biomimicry, swarm elements must physically interface with one another to aggregate the most efficient, modern warfare solutions. Autonomous drone to drone payload transfer is an elemental platform technology required for intraswarm cohesion; solving mission logistics and enabling significant advances in the swarm's ability to coordinate its efforts for complex and extended tasks. Embracing biomimicry, swarm elements must physically interface with one another to aggregate the most efficient, modern warfare solutions. Autonomous drone to drone payload transfer is an elemental platform technology required for intraswarm cohesion; solving mission logistics and enabling significant advances in the swarm's ability to coordinate its efforts for complex and extended tasks.</p> <p>Autonomous operators within the swarm will be specially designed to facilitate the needs of the whole, by possessing the ability to mechanically exchange payloads. This unique ability affords warfighting capabilities currently unattainable:</p> <ul style="list-style-type: none"> · Scalable and modular logistics solution with the ability to integrate services across a range of environments without mission interruption · Indefinite mission range and duration · Secure communication strategies, multi-dimensional and multi-modal · Real time responsive tactics for a dynamic and continuously evolving theatre · Discriminately target and neutralize individual micro targets · Reduce unwanted collateral damage to persons or property
<p>Turbo Pure Water</p>	<p>Protect the warfighter and the aircraft on which they rely. Our customizable high purity water turbine rinse systems mitigate corrosion, improve operational readiness and reduce maintenance costs by millions. Turbo Pure Water™ systems are an essential piece of GSE, trusted by the U.S. Coast Guard and Army Reserve National Guard. These systems also support the health of the warfighter by providing high purity water for medical applications and biologically-secure drinking water anywhere in the world.</p>
<p>Facility Management Hardware & Software System</p>	<p>Qwik Response Systems is a customizable Facilities Management Hardware and Software System that connects every worker in the workplace with our standard universal military grade QRS IOT device. Qwik Response incorporates cutting edge 21st century technology into the QRS IOT Device... such as asset tracking, drone deployment, push to talk, real time reporting, text, talk, email, barometric/altitude reading and more all in one device eliminating the need for multiple devices being carried around. The QRS IOT device brings the "Internet of Things" into the battlefield, field hospital or military base increasing communication, accountability, productivity and safety for all military personnel.</p>

<p>ARGANOT – Area Radiation Gamma and Neutron Origin Telemetry</p>	<p>The device is called ARGANOT and stands for Area Radiation Gamma and Neutron Origin Telemetry. ARGANOT systems perform radioisotope source alarming, localization, identification, and dose monitoring. This device is accurate stand-alone, and very accurate when networked to identify and locate special nuclear materials. ARGANOT is a reconfigurable (wearable, UAS, UGV, ...) module that provides neutron and gamma-ray spectroscopy within a single package. The cutting-edge DS-MSNDs sensors provide neutron detection and SrI or CsI scintillators are used for gamma-ray spectroscopy. The modules can be operated standalone or with other ARGANOT modules as a wearable/ hive/ ... detector system. The ARGANOT detectors can be configured to operate wireless or in a wired/low-RF modes.</p> <p>The ARGANOT modules are the lowest profile, networkable, neutron/gamma detectors available. Both overt and covert radiation detection operations can be performed with these detectors. In-place area monitoring is also possible by operation in standalone mode (e.g. deployed at entry/exit points or radiation facilities to monitor movement of radioactive material).</p>
<p>The Nomad Security Fence System</p>	<p>The Nomad Security Fence System is a portable protection fence that does not penetrate the ground or use external weights. The patented post assembly uses steel picket fence panels that can be installed on multiple terrains without the use of equipment and is easily transported. The modular components allow for added security and technology accessories. The Nomad system is a force multiplier that can fit into any technology category that would benefit from higher security but is restrained by ground conditions.</p>
<p>Asset Exchange Manager (AxM)</p>	<p>We at Rheaply help large organizations make resources discoverable, easily transferable, and more valuable across their organization and wider communities. Clients from Google to MIT to the Defense Logistics Agency use our Asset Exchange Manager (AxM) platform to easily manage, find, swap, or rent any physical asset. Similar to our commercial partners, we help the military avoid unnecessary procurement, extend the lifetime of their assets, and divert waste from landfills.</p>
<p>Smart Tension Guard</p>	<p>Smart Tension Guard is a product that will be used in logistic applications. It will deliver immediate results to a portable electronic device of any irregularities with the tension of all tie down applications. This will provide efficiency and peace of mind for all private and public consumers, by confirming securement of their load being transported. In a military application it will also provide safety for operators not needing to exit the vehicle to check on load securement.</p>

<p>The Sustainment Market Research Product and the Sustainment Industrial Base Intelligence Product</p>	<p>Sustainment is an online software platform that efficiently connects manufacturing vendors and heavy industry to enable American manufacturing. We built the Sustainment platform to enable small and medium-sized businesses such as machine shops, metalworking companies, engineering services, and manufacturing companies. Our platform gives these businesses the ability to showcase to, and be discovered by, government and large commercial procurement teams. These procurement teams receive the benefit of a radically streamlined effort for market research and vendor discovery for manufacturing services and the broader manufacturing ecosystem</p>
<p>Directional, Hands-free, Wearable Personal Radiation Detector for First Responders</p>	<p>Radiological/nuclear detection is an essential component to homeland security and emergency response. Tac-Alert's patented wearable technology addresses four main problems expressed by first responders with current equipment: (1) simple user interface allows for covert surveillance; (2) higher sensitivity permits users to detect sources faster and from greater distances; (3) easy operation with minimal training and retraining; and (4) built-in directionality automatically locates the source. Tac-Alert's emerging technology has already received multiple military endorsements and will debut as a hands-free wearable with optional smart phone app. Our technology capabilities directly align with three Department of Homeland Security mission goals.</p>
<p>G-Drobe 360 Utility Lighting Harness</p>	<p>Techrein Public Safety Innovation is a wearable technology startup providing innovative safety solutions to personal protective equipment for government workers who work or engage in high risk/low lighting environments. Techrein's mission is to save lives by integrating wearable technology in everyday activities.</p>
<p>Visual Human Behavioral Detection Using AI and Skeletonization Data</p>	<p>This technology improves operational security and protects the warfighter by using video systems, combined with artificial intelligence, to detect and predict behavioral outcomes and more quickly assess threats. The system can be used to detect abnormal behaviors in the humans it monitors such as swimmer and drowning detection and internal/external human threats (active shooter). It reduces security lapses due to fatigue and human error. The technology operates 24/7/365 with minimal human interaction and can be deployed via fixed installations or remote systems such as drones or human piloted vehicles.</p>
<p>Tether Tech Safety Wheel End Safety System</p>	<p>When bearing failure, lug nut failure or lug stud failure occurs on a semi trailer axle, the TTS WESS will keep wheel assembly from separating from the trailer. In the event of bearing failure, the TTS WESS will reduce or nullify damage to spindle and provide mobility during a combat situation to reach safe haven for repairs. The TTS WESS will reduce injury, property damage, and fatalities by preventing wheel separation from lug nut and lug stud failures, as well as bearing failures.</p>

<p>Minimum Risk, Non-Lethal Liquid Feral Hog Deterrent</p>	<p>All natural, non-lethal feral hog deterrent developed as a liquid spray that can be applied as a barrier along desired property boundaries to repel feral swine from an area with additional utilization as a seed treatment to protect crop emergence. The product is designed for use on residential, commercial, governmental, tribal, recreational, and agricultural properties to protect valuable assets and reduce the financial loss created by feral hog damage. With an estimated nationwide economic impact from damage of \$2 billion annually this product can protect airports, cemeteries, parks, waterways, greenspaces, and other sensitive areas from feral hog impact.</p>
<p>Zramic (pronounced Z-ram'-ic), a Novel Corrosion Protective Nanostructured Coating</p>	<p>Advances in materials have a significant impact on future warfare and military instruments of power, which led to the creation of Zramic. Zramic is an innovative environmentally friendly nanostructured anti-corrosion coating. Zramic incorporates a two-layer approach that prevents the diffusion of corrosive species to the substrate, while providing localized substrate protection from corrosion. This capability is long lasting since Zramic provides a strong unique bonding to the substrate. Zramic decreases maintenance costs and the time assets spend in the depot, allowing for more efficient use of US DoD assets.</p>
<p>The Odyssey Technology™ defense procurement solution</p>	<p>Odyssey is a procurement technology framework leveraging emerging technologies now available in the Era of Pervasive Computing. Odyssey' construct is an AI core layering IoT & Blockchain. This creates a holistic environment to radically alter DoD's procurement process. This solution not only creates annual cost saves anticipated to be in the hundreds of millions; but also, improves the security of the supply chain in terms of cybersecurity and raw material security.</p>
<p>BattleDeck Trailer Flooring System</p>	<p>We have truly created an innovative solution to a decades-old problem. VertiPrime has developed the BattleDeck® Trailer Floor System. With BattleDeck® we propose not just a replacement of traditional flooring materials; but also, a complete redesign of trailer decking for tactical use. From lighter in weight, flame resistance, complete protection against UV damage to 570% stronger when compared to the current Apitong wood.</p>
<p>VRC COLD SPRAY APPLICATION DEVELOPMENT</p>	<p>VRC Metal Systems manufactures Cold Spray equipment that bonds metallic powders to nearly any metal surface. The high-pressure system deposits similar and dissimilar metals on most metallic surfaces even in previously impossible heat sensitive applications. VRC's supersonic cold spray equipment enables innovative solutions for repair, additive manufacturing and coatings for many industries including aerospace and defense. VRC has played an integral part in the approval of the repair process by using high-pressure cold spray to repair Army helicopters, Navy submarines and the B1-B Bomber in the Air Force. VRC is building on over \$16 million in research and development efforts.</p>

<p>Shard Is a Vertical Take Off High Altitude Unmanned Aerial System</p>	<p>Shard is a new Vertical take-off UAS currently in development, Our VTO UAS is deployable at high altitudes without the need for a runway, Shard is a bullet resistance UAS available in 2 sizes 4ft and 9ft. The 4ft UAS is suitable for aid to personnel on tactical missions. The 9ft UAS is designed for long range reconnaissance and support it is capable of transporting goods up to 40lbs and delivering goods to assigned locations.</p>
<p>Blast-Wall</p>	<p>The Blast-Wall redirects jet wash into the air instead of across the ground. This provides a smaller footprint on the testing area. Each Blast Wall unit is mobile with a right & left used in tandem to make the area wider or smaller as needed. The Blast Wall uses an air over hydraulic jack system to assist with the mobility of each unit.</p>
<p>CR-12 MAWS (Modular Advanced Weapons System) 12 Gauge Shotgun and Rifles System</p>	<p>Battlefield scenarios and mission objectives can change quickly. The CR-12 MAWS (Modular Advanced Weapons System) is a first in class field reconfigurable weapons platform. With no tools required can interchange barrels on the shotgun from a short breaching barrel to a standard tactical barrel. Upper receiver can be interchanged with 7.62 x 51 mm NATO or 6.5 Creedmore tactical or long range precision rifles. This new weapons system can address this changing scenario.</p>
<p>Drone hosted wireless sniffer</p>	<p>Before start building/deploying anything a survey is done. Wireless Technologies, however, require authentication or authorization to detect the power of the signal so surveying is not as easy without pre-authorization. Arukona's ARK-500 is a drone hosted wireless sniffer not only has no requirement for any pre-authorization to detect the wireless transmitters around it but also can mimic itself as one of those signals. With a weight of 780 grams and have enough battery power to operate 5 days without charging, ARK-500 can be attached to any drone while its unique frequency handoff can isolate drone's operation from ground operation.</p>
<p>Secure Human subscriber Identity Module (SIM)</p>	<p>Security is the most important item in everyone's lives. Unfortunately, nothing is as secure as we would like it to be. In the battle-field importance of a secure line is a life and death issue. HUMAN SIM is a DNA based encryption that is more secure than any other encryption technology.</p> <p>Humans have about 3 billion base pairs, for a total of about 4^{3,000,000,000} different DNA strands of human size. To get a repeat you'd need around 2^{3,000,000,000} people. In all time there will never be nearly this many people. Human SIM is THAT secure!</p>

<p>Lightweight Hemp based Thermal Casing for combat.</p>	<p>Combat gears require extremely durable, lightweight materials. Although materials like Kevlar provide such durability, they lack one major item, which is breathability and thermal isolation.</p> <p>Arukona is working on development of highly flexible, high thermal signature casings of combat equipment with durability, protection, and breathability yet extremely lightweight materials made from hemp.</p>
<p>Z210 Remote Drop Release Aerial Accessory</p>	<p>Remote controlled Z210 Drop Release system for use with UAS. Improves successful delivery of payloads with HD camera and on-board power system. Deployable at a faster rate than traditional technologies. Compact and impact resistant. Max payload of 50 lbs. Currently in use by First Responders in Oklahoma. Design is scalable for larger payloads. Utilizes a proprietary adapter compatible with a standard Picatinny Rail system to attach to almost any UAS. The technology is at a Technical Readiness Level of 8 and addresses the DoD need for Operations and Mission Support. The drop system has been tested in the field. Max payload tested 10 lbs. Operational in a proven military capacity will show feasibility as a TRL 9.</p>