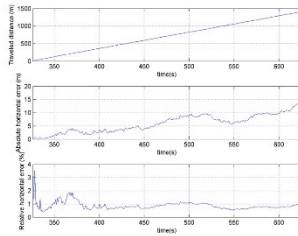




# A-01: Honeywell Resilient Navigation



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Honeywell
<b>Principal Investigator:</b>	Samuel Fleishman
<b>Technology Readiness Level:</b>	TRL 8: Actual system completed and qualified through test and demonstration.
<b>Research Area of Interest:</b>	A) Unmanned Aerial Systems
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Perform several (1-3) UAV test flights with different trajectory shapes (rectangular trajectory, straight line, circular) to demonstrate a navigation performance in case the GPS signal is not available. The GPS signal will be either jammed with a real GPS jammer (if it is available) or it will be disabled by our SW remotely.

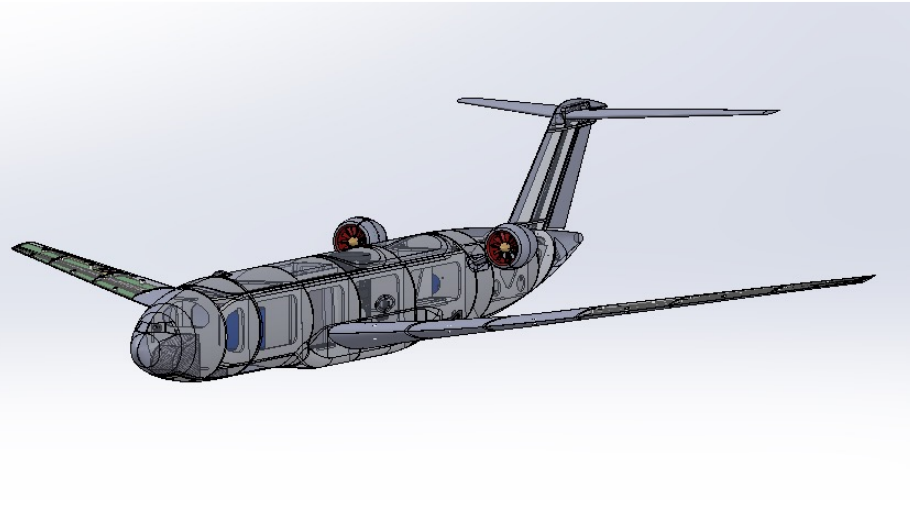
## SYSTEM DESCRIPTION

Honeywell Resilient Nav is composed from GPS/INS navigator which is aided by the radar system which provides body velocity measurements and anti-jamming GPS device. The key component is the radar system which consists at least 3 radars which measure velocity in 3 different directions so all components of the vehicle body velocity vector (x,y,z) can be measured independently on any other vehicle sensors. Theoretically only 2 radars can be used if the vertical velocity is known but system performance in a such configuration is worse in comparison with 3 radars configuration. Generally, system provides better navigation performance with increasing number of used radars. Particular radar velocity measurements can be used to aid directly the navigation filter in the GPS/INS system or particular radar velocity measurements can be converted to the body velocity vector first and then this body velocity vector is used to aid the navigation filter.



# A-04: Novel Aeroservoelastic Scaled Model

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	M4 Engineering, Inc.
<b>Principal Investigator:</b>	Myles Baker
<b>Technology Readiness Level:</b>	TRL 7: System prototype demonstration in an operational environment.
<b>Research Area of Interest:</b>	A) Unmanned Aerial Systems
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Demonstrate the integration of embedded instrumentation (pressure, acceleration, and fiber optic strain measurements), embedded data acquisition and logging, scaled model design approaches for aeroservoelasticity, and scaled model fabrication approaches tailored to wing structures using a 150lb, 15% scale model of the 737-900 with a wing span of 12ft.

In these flight tests, we will demonstrate basic manual-control functionality with a safety pilot. If successful with sufficient time and budget remaining, we will also demonstrate stabilized flight with the autopilot and waypoint navigation using the QGC ground control system and fully autonomous flight (other than takeoff and landing).

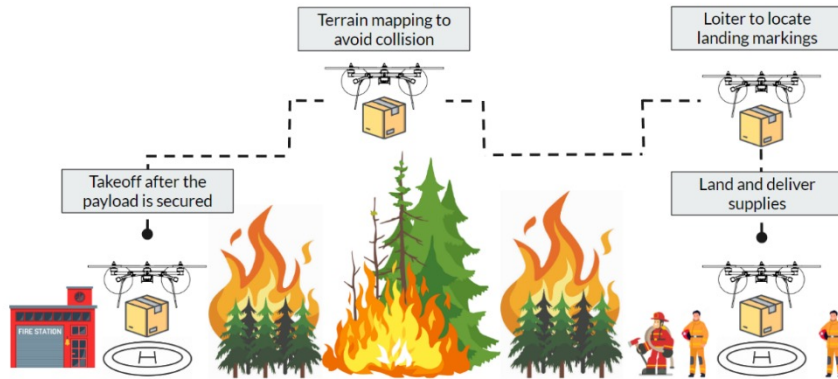
## SYSTEM DESCRIPTION

To carry out the experimental test plan, a subscale remotely piloted flight test vehicle will be utilized. The configuration is based on a commercial transport (737-900), and is sized to carry 50 lb of payload, which will include a FOSS interrogator needed for shape measurement and control. The vehicle is an all-electric configuration with TOGW of 150 lb (50 lb payload, 50 lb airframe, 50 lb batteries), with a wing span of 12 feet.



# A-05: Long Range, Heavy Lift Precision Cargo Drop

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



Scenario 1: Delivering Equipment and Supplies to Help Aid Forest Fire

## PROJECT INFORMATION

<b>Organization Name:</b>	Toofon, Inc.
<b>Principal Investigator:</b>	Curtis Leo
<b>Technology Readiness Level:</b>	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
<b>Research Area of Interest:</b>	A) Unmanned Aerial Systems
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

The long-range, heavy lift vehicle designed for precision payload drop will be delivering payloads exceeding 150lbs. Its stability at the moment of release is untested.

## SYSTEM DESCRIPTION

Our vehicle's control algorithms ensure stability, but we seek to test system agility with the ferrying and release of payloads outweighing the unladen airframe.



# A-07: Autonomous Surveillance & Delivery without GPS

## Power Efficient Flight & Navigation Algos

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



### PROJECT INFORMATION

<b>Organization Name:</b>	Rhoman Aerospace
<b>Principal Investigator:</b>	Thomas Youmans
<b>Technology Readiness Level:</b>	TRL 7: System prototype demonstration in an operational environment.
<b>Research Area of Interest:</b>	A) Unmanned Aerial Systems
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

### PROPOSED EXPERIMENT OVERVIEW

Rhoman is developing power efficient algorithms for UAV flight, autonomy and positioning systems for GPS denied and degraded environments, and stabilized tethered payload systems. The proposed flight tests include flying a UAV beyond line of sight from McMillan Airfield to the CACTF location, while having switched off the GPS unit on the UAV. The proposed UAV is a small 3ft octocopter that has been flown at Camp Roberts previously during a JIFX event. Various flights of a pre-planned flight route within the McMillan airfield area using a Rhoman custom control algorithm and a standard control algorithm may be performed, with total power-use measurements to be taken and compared. A stabilized tethered payload system may be tested if time permits.

### SYSTEM DESCRIPTION

Rhoman is developing power efficient algorithms for UAV flight, autonomy and positioning systems for GPS denied and degraded environments, and stabilized tethered payload systems. The autonomy without GPS proposed system is designed to enable a UAV to maintain a rough heading for a surveillance mission, without GPS, and specifically using low-cost commercial sensors. Various visual feature sets and objects are tracked by the system. The power efficient UAV algorithms are designed to enable banked-style turns and use less power during operations than classic multi-copter control algorithms. The stabilized tethered payload system auto-adjusts the position of a UAV in order to balance a payload on a tether.



# D-02: Enabling rapidly relocatable USMC C2 with 5G Technology

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	AT&T
<b>Principal Investigator:</b>	Robby Schimelpfening
<b>Technology Readiness Level:</b>	TRL 7: System prototype demonstration in an operational environment.
<b>Research Area of Interest:</b>	D) Communication and Networking
<b>Experiment Location:</b>	Naval Postgraduate School

## PROPOSED EXPERIMENT OVERVIEW

In support of a student thesis, AT&T will provide a man-portable cellular system and a tent to simulate a Battalion sized USMC Mobile Operations Center. Student will use 5G mobile networking capabilities to rapidly network laptops, tablets, servers, and IOT devices and conduct a series of simple command-and-control vignettes to gain initial experience with 5G technology.

## SYSTEM DESCRIPTION

AT&T will provide a proprietary prototype of a man-portable Cellular system being developed to support military and first responder mobile communications and networking requirements.

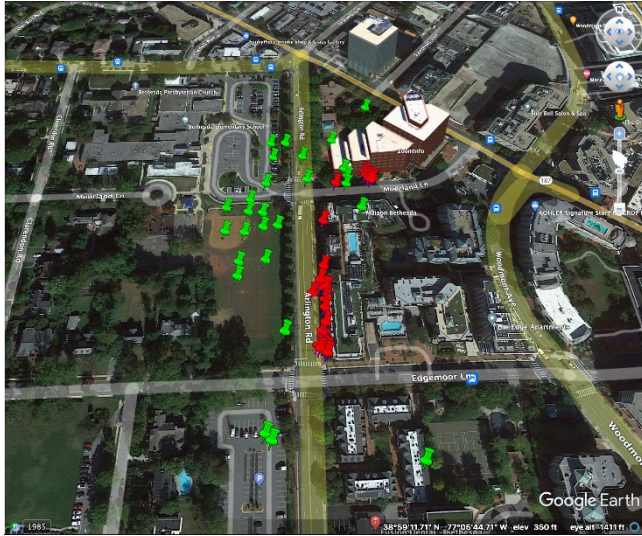




# E-02: Ghost in the Sky



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Raven Works
<b>Principal Investigator:</b>	Kenneth Tarrant
<b>Technology Readiness Level:</b>	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
<b>Research Area of Interest:</b>	E) Cyber, Cyber Security, and Electronic Warfare
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Raven Works plans to conduct commercial drone incursions on counter UAS technology. The experiment will pit consumer grade as well as industrial grade sUAS against counter UAS technology. We will fly the sUAS from multiple distances, altitudes, directions, with terrain and with custom firmware modifications attempting to make these drones invisible to counter UAS technology. From the data gathered it will be determined how an adversary may try to defeat counter UAS operations. This problem set is front and center in the War in Ukraine showing how future battles will be fought utilizing commercially available technology. This experiment will utilize the DJI Aeroscope which is their military/ Law enforcement solution for counter UAS. It is able to determine the drones location as well as the ground station location in a matter of seconds if the sUAS is in range.

## SYSTEM DESCRIPTION

DJI Aeroscope which is a system that contains an SDR that is capable of seeing all DJI drones in an area as well as the ground control station. It is a passive system that looks for DJI signals. Drones that will be utilized will be DJI Matrice 300, DJI Mavic 3, and Freefly Altas X.



# E-03: Cyber Vulnerability Assessment – Indago 4



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Lockheed Martin
<b>Principal Investigator:</b>	Jeff Gardner
<b>Technology Readiness Level:</b>	TRL 8: Actual system completed and qualified through test and demonstration.
<b>Research Area of Interest:</b>	E) Cyber, Cyber Security, and Electronic Warfare
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Indago 4 is a new platform following the heritage of the Indago Tactical UAS line of systems. Indago has been used for the past decade within US DoD and Dept. of Homeland Security applications. We are looking to work with teams at the Field Experimentation Event to assess the Cyber Vulnerability of the new platform. The Lockheed Martin team will follow the interagency leads on proper testing and assessments. We do not expect to fly the systems unless you request so.

## SYSTEM DESCRIPTION

Lockheed Martin VTOL Indago 4 system release for experimentation within the operational and test bounds for potential in-field use. US DoD focused product line.



# F-01: Multi-Domain Expeditionary Artificial Intelligence and Behavior Analysis at-the-edge for Tactical Surveillance Application



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1

7 – 10 November 2022



MT-5 Autonomous Surveillance System



Phalanx Shield UGS



## PROJECT INFORMATION

<b>Organization Name:</b>	Gantz-Mountain Intelligence Automation Systems Inc.
<b>Principal Investigator:</b>	Greg Wilson
<b>Technology Readiness Level:</b>	TRL 9: Actual system proven through successful mission operations.
<b>Research Area of Interest:</b>	F) Intelligence, Surveillance, and Reconnaissance (ISR)
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Gantz-Mountain's MT-5 will experiment with ways to optimize expeditionary power solutions to extend battery life for its smart surveillance systems. Specifically this will include integration of state-of-the-art external triggers (PIR, Seismic, RF) from Innovative Algorithms (Phalanx Shield and R5) to wake-up and tip/cue Gantz-Mountain's Intelligence Sensor Nodes (ISN) to conduct AI and threat behavior analysis. Upon external triggers, the MT-5 will pass near real time alerts and imagery of threat behaviors across Mission Command systems (TAK, COPERS, etc.) Additionally, Ascent Solar's solar panels options will be used to optimize expeditionary power and energy solutions.

Capability Experimentation goals:

- Increase robustness of AI-driven Behavior Analysis at the Tactical Edge
- Extend ISN autonomy / battery life from hours to weeks by leveraging wake-up triggers and solar panels
- AI target hand-off to autonomous ISR systems to compress targeting cycle

## SYSTEM DESCRIPTION

**MT-5:** The world's toughest Warriors and First Responders deserve custom built expeditionary smart surveillance technology with Artificial Intelligence and Behavior Analysis at-the-edge to guarantee success. Gantz-Mountain Intelligence Automation Systems Inc. has pioneered revolutionary turn-key smart-edge surveillance and intelligence automation systems to answer this call. This rapidly deployable technology pushes Artificial Intelligence and Behavior Analysis to the tactical edge to provide manpower savings, improve decision making and enhance early warning during multi-domain operations.

**Phalanx Shield:** A vertically integrated, CoT-based, high performance sensor system capable of detection of human / vehicle activity at distances of over 100 meters via seismic, passive IR, and other sensor technology. Sensors are capable of up to four-year autonomy and 15 Km communication range and back-haul using MANET radio, cellular, or CubeSat.

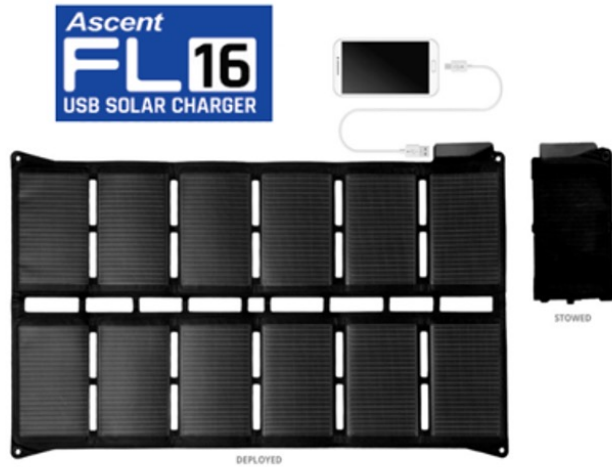






# F-02: Expeditionary Power for ISR, Computing and Operation Critical Technologies

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Ascent Solar Technologies
<b>Principal Investigator:</b>	Shannon O'Reilly
<b>Technology Readiness Level:</b>	TRL 7: System prototype demonstration in an operational environment.
<b>Research Area of Interest:</b>	F) Intelligence, Surveillance, and Reconnaissance (ISR)
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

The ASTI FL16 Solar Charger will be paired with a variety of collaborator technologies to assess use in the field providing primary and auxiliary power. Anticipated collaborator technologies include remote controlled ISR vehicles, ruggedized laptops, multi-bay battery chargers for BB2590/PRC152 units and in-field stationary ISR sensors. During the exercise various qualitative data will be collected such as time to deploy, ease of deployment for each technology with a focus on austere in-field deployment. For each test scenario, base data such as charge time and rate, surface temperature, and thermal signature will also be collected.

## SYSTEM DESCRIPTION

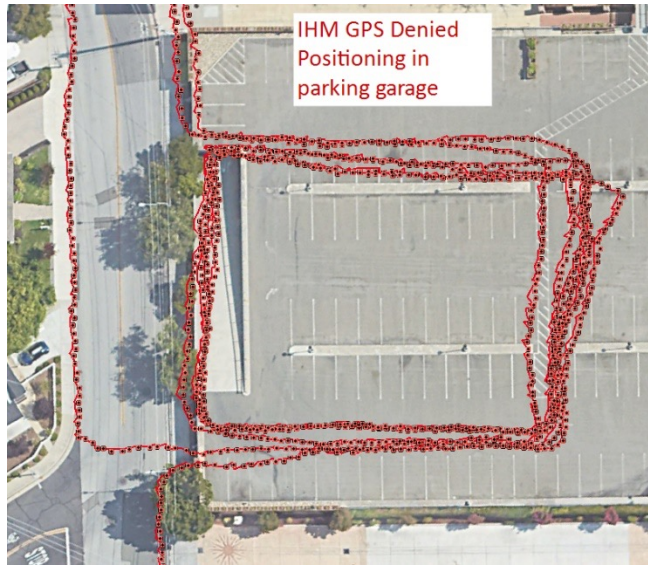
The FL16 Solar Charger provides 16W USB (5V, 2.4A) power in direct sun, and usable power in low-light/overcast skies. Made of ASTI's ultra-flexible and lightweight PV technology the FL16 is the most advanced and reliable in-field solar charging solution for the warfighter.

- Charges USB EDU's (eg. ATAK) at the same or faster rate as a traditional wall plug
- Can provide more than enough power in 1 day's charge for 24hrs of navigation and communications
- Significant weight savings vs. BB2590 and PRC152
- Allows continuously-replenished power for EUD's, with no ongoing logistics demands; allows units to move faster and with more resilience in all logistics scenarios.



# G-01: Intelligent Human Motion GPS Denied Trials

Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Yotta Navigation
<b>Principal Investigator:</b>	Andrew Hazlett
<b>Technology Readiness Level:</b>	TRL 5: Component and/or breadboard validation in relevant environment.
<b>Research Area of Interest:</b>	G) Situational Awareness
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Yotta Navigation plans to experiment testing alternative navigation systems in GPS denied environments. GPS denied navigation will be conducted in mock operational environments at Camp Roberts training facilities. Subterranean, tunnel, indoors and GPS RF denied positioning tests will be conducted.

## SYSTEM DESCRIPTION

Intelligent Human Motion is Yotta Navigation Corporation's latest advancement in real-time dismounted human motion tracking and positioning. IHM provides real-time human motion event profiles for both time series and spacial analysis. The IHM Nav based positioning engine fuses motion sensors, radio frequency (RF) positioning and geographical data to provide an accurate and robust navigation system. IHM Nav provides continuous positioning in GPS denied conditions, including indoor and subterranean environments, and GPS jamming/spoofing attacks. IHM Nav also enables GPS duty cycling power saving, providing a critical solution to battery longevity and heat generation reduction for M-Code receiver handheld integration.



# G-02: Multi-Institutional All-Domain Command and Control (MIAD-C2)



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022

## PROJECT INFORMATION

<b>Organization Name:</b>	The MITRE Corporation
<b>Principal Investigator:</b>	Trevor Bostic
<b>Technology Readiness Level:</b>	TRL 4: Component and/or breadboard validation in laboratory environment.
<b>Research Area of Interest:</b>	G) Situational Awareness
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

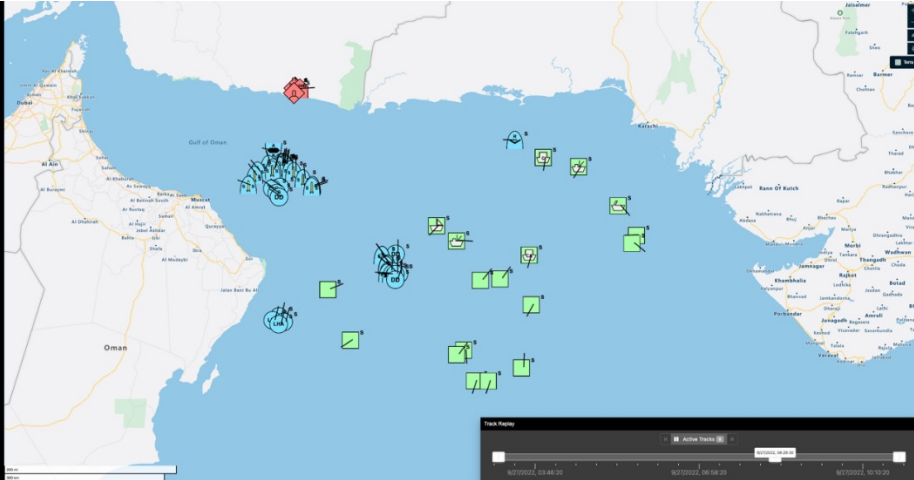
## PROPOSED EXPERIMENT OVERVIEW

During JIFX, we intend to test several platform capabilities for mission focused UxS demonstrations including:

- Post-mission data ingest, replay, and evaluation of a drone after performing a recon mission in non-emitting mode
- Demonstrate live and near real-time data visualization of key UxS sensing modalities.
- Mission scenario integration of physical and simulated platforms using other JIFX experimenters with our sim suite.
- Make experimental data available for download for after-action evaluation and AI/ML use cases

## SYSTEM DESCRIPTION

MIAD-C2 is a modernized Zero-Trust, Cloud based Situational Awareness (SA) platform that supports the display, testing, and evaluation of novel UxS platforms. Its key features include UxS aware displays for modern sensing modalities, simulation of large-scale mission scenarios and UxS platforms, and data storage for after-action replay, analysis, and AI/ML use cases.





# I-01: Wildland Respirator



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	TDA Research, Inc.
<b>Principal Investigator:</b>	Girish Srinivas
<b>Technology Readiness Level:</b>	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
<b>Research Area of Interest:</b>	I) Health and Safety
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

We wish to know if TDA's lightweight Powered Air-Purifying Respirator (PAPR), called the Wildland Respirator (WR), would work for SOFs and National Guard personnel operating in smoky conditions.

We'll ask evaluators to perform physically taxing activities while wearing the WR, and report their impressions to data collectors. Information collected would include evaluators' opinions on the WR's usefulness, if it conflicted with their ability to operate normally, and any improvements they see as necessary or desirable. If possible, we want to collect audio from evaluators as they communicate using land mobile radios. The WR's half-mask has a speech amplification module, and we need to know if evaluators are intelligible over the radio while wearing the WR.

## SYSTEM DESCRIPTION

TDA's Wildland Respirator (WR) is a lightweight Powered Air-Purifying Respirator (PAPR). It consists of a blower, a battery pack, a control system, filters, a housing with user controls, a breathing hose, and a half mask.

The WR pulls smoky air through a HEPA filter and a carbon filter, removing at least 99.97% particulate matter and all of the chemical vapor challenges associated with burning biomass (except for carbon monoxide).

The WR uses a rechargeable battery pack and, in emergencies, can recharge from AA alkaline batteries. Its filters (HEPA and Carbon) are single-use. However, they are expected to last 4 to 8 hours depending on the quality of the air they're filtering.





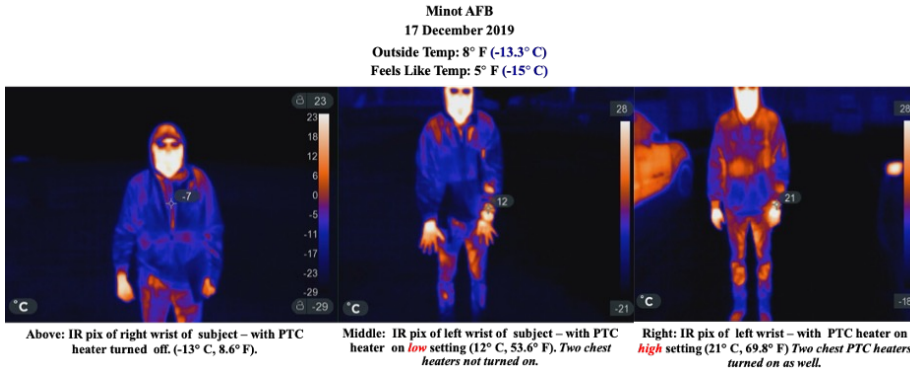
# I-02: Low-Energy Approach to Improved Battery Performance in Cold Weather



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022

## PROJECT INFORMATION

<b>Organization Name:</b>	Carver Scientific
<b>Principal Investigator:</b>	Tom Tait
<b>Technology Readiness Level:</b>	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
<b>Research Area of Interest:</b>	I) Health and Safety
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts



## PROPOSED EXPERIMENT OVERVIEW

CSi will place military issue multi-purpose batteries in a cooler to replicate their use in Arctic Operations. One or more batteries will be warmed by PTC heaters. We will display each battery's performance in near real time and compare the results to demonstrate PTC effectiveness to extend battery life and mitigate the effect of cold weather on batteries. We plan to have live FLIR capabilities to provide additional detail to the PTC effectiveness for both man-wearable and battery/electronics applications.

## SYSTEM DESCRIPTION

The Positive Temperature Coefficient (PTC) printed electronic man-wearable heater provides targeted, rapid warmth to body core and extremities to mitigate the effects of cold weather. Additionally, these paper-thin, lightweight (less than 1 oz), flexible, low power heaters can be used to warm batteries and electronics. CSi can customize the heater configuration for specific purposes. PTC heaters are safe, affordable and disposable with a low logistical tail that meets many SWaP-C goals. We can use a variety of DoD and COTs batteries to provide a long-lasting charge (> 4-8 hours depending upon conditions). The heaters can be placed near critical heat loss sites (integrated with clothing or stand-alone).



# J-01: Ballistic Conformal Battery



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Cornerstone Research Group
<b>Principal Investigator:</b>	Brian Henslee
<b>Technology Readiness Level:</b>	TRL 7: System prototype demonstration in an operational environment.
<b>Research Area of Interest:</b>	J) Expeditionary Operations
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

We will use the ballistic Conformal Battery to power all soldier systems worn by the warfighter.

## SYSTEM DESCRIPTION

CRG's Ballistic Conformal Battery (BCB) is an integrated systems approach to soldier worn body armor and batteries that reduces size and weight over existing separate systems. Multiple variations of the BCB have been prototyped or demonstrated with threat protection levels ranging from 9mm handgun up to 7.62mm rifle threats, and available power ranging from 100-300 Wh at 14.4 V.



# K-01: Solar Electric Generator on a Trailer



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



## PROJECT INFORMATION

<b>Organization Name:</b>	Solar Electric Technology
<b>Principal Investigator:</b>	Jerrold Karmin
<b>Technology Readiness Level:</b>	TRL 1: Basic principles observed and reported.
<b>Research Area of Interest:</b>	K) Infrastructure and Power
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Testing a new improved design compared to previous unit.  
Will be able to see how it performs compared to a prior unit

## SYSTEM DESCRIPTION

This unit folds and unfolds for easy deployment, and single access tracking. Easily deployed for power production in minutes



## K-02: Squad Power Management



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



### PROJECT INFORMATION

<b>Organization Name:</b>	Cornerstone Research Group
<b>Principal Investigator:</b>	Brian Henslee
<b>Technology Readiness Level:</b>	TRL 8: Actual system completed and qualified through test and demonstration.
<b>Research Area of Interest:</b>	K) Infrastructure and Power
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

### PROPOSED EXPERIMENT OVERVIEW

Will use the system to adapt a range of available power resources to support high power (up to 2500W) equipment, or generally convert power from DC to AC to creating a small soldier portable mobile microgrid. Will take DC input from solar, fuel cells, batteries and alternators and AC input from 120V sources to provide a combined high power output supporting equipment like battery charging stations, tactical directed energy systems, refrigeration systems, or mobile basing operations.

### SYSTEM DESCRIPTION

The Adaptable Power Scavenger is a man portable microgrid that supports defense equipment with electrical power. It accepts multiple DC input power sources like car batteries, alternators, BB-2590's, solar panels, and fuel cells, and AC inputs from wall or generator power then combines them in to one high power output to support operational system needs. The system is available in two sizes, one that provides up to 2500 W output and a smaller compact version providing up to 500 W output.





# K-03: 6-Pack for Austere Uninterrupted Power



Naval Postgraduate School Joint Interagency Field Experimentation (JIFX) 23-1  
7 – 10 November 2022



**BTE-70791A-T1B**  
6-PACK

## PROJECT INFORMATION

<b>Organization Name:</b>	Bren-Tronics
<b>Principal Investigator:</b>	Christian Chandler
<b>Technology Readiness Level:</b>	TRL 9: Actual system proven through successful mission operations.
<b>Research Area of Interest:</b>	K) Infrastructure and Power
<b>Experiment Location:</b>	NPS Field Laboratory at Camp Roberts

## PROPOSED EXPERIMENT OVERVIEW

Bren-Tronics will deploy the 6-Pack portable power system through collaboration with government personnel and industry vendors, and will explore the application of emerging technology solutions that provide the requisite power necessary to accomplish these mission sets: including the full spectrum of offensive, defensive, stability, or civil support operations. The Measurements and Data Collection Plan will be gathered during planned and ad hoc experiments throughout the week. Bren-Tronics personnel will be on site to support. Ease of use and reliability will allow for dismantled and improvised Urban Operation scenarios. The following criteria will be utilized to determine the Measures of Performance and Effectiveness: Reliability, Ease of Use, Power Generation Effectiveness.

## SYSTEM DESCRIPTION

The 6-PACK is a rugged, watertight energy system that can power a variety of small AC and DC equipment. It uses up to 6 military standard BB-2590/U batteries, has integrated AC and DC charging, and a variety of input and output accessories for different applications. The 6-PACK consists of two banks of batteries that enable either 12V or 24V operation. It can charge from a variety of input sources allowing for continuous powering for appropriate loads. Built in MPPT enables charging from renewables and provides a fully autonomous power solution. Depending on the power consumption and application, the 6-PACK has the potential to provide continuous energy for full mission duration runtimes in standalone mode, or indefinite operation when connect to a renewable source (e.g. solar)