JIFX

Joint Interagency Field Experimentation

JIFX 25-3 Quad Charts

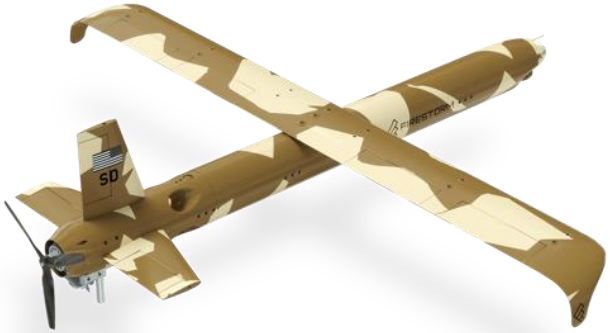
12 – 16 May 2025

Hosted by the Naval Postgraduate School

With Sponsorship from:

Innovation & Modernization Office

A-04: Tempest Modular UAS



Organization	Firestorm
Principal Investigator	David Priebe
Technology Readiness Level	TRL 8: Actual system completed and qualified through test and demonstration.
Research Area of Interest	A) Unmanned Aerial Systems
Funding	Internally

Proposed Experiment Overview

Firestorm intends to bring our new Tempest aircraft with a microturbine jet and internal combustion engine for testing and experimentation. With our aircraft, we intend to test our altitude, range, speed limits, multiple alternative navigation units, launch mechanism, and terminal guidance engagements. We will use prior altitude, range, and speed tests as our baseline and test in increments beyond each of those values to systematically determine the improvements in each of those categories. For our alternative navigation units, we will run them in parallel with the onboard navigation units for comparison. By the end of the event, we aim to use the alternative navigation units to feed directly into our autopilot. Part of our testing will utilize a catapult launch mechanism and terminal guidance engagements.

System Description

Firestorm's Tempest is a Group 2 Modular Unmanned Aerial System (mUAS) utilizing an additively manufactured (3D printed) airframe. Tempest provides operational versatility through its' open architecture and "Lego building block" approach to design, enabling full modularity from propulsion systems (3 options), payloads, sensors, and munitions and extending to the airframe itself. These features combined enable operators to adjust configurations / capabilities in the field to meet mission demands in mere minutes as opposed to days or weeks. Tempest empowers tactical-level units with organic capability to service a wide array of mission needs by merely swapping the payload. This modular approach reduces reliance on larger, high-demand, and low-density platforms.

A-05: Vision based object tracking and following

Organization	Odys Aviation Inc
Principal Investigator	Axel Radermacher
Technology Readiness Level	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
Research Area of Interest	A) Unmanned Aerial Systems
Funding	Internally

Proposed Experiment Overview

Autonomous takeoff and landing using visible spectrum cameras and using IR cameras for night flights. Flights would also include vision-based navigation for waypoint following. The drone can also detect and track objects.

System Description

The core technology is a fully onboard, low SWaP and low power object tracking and guidance algorithm, using only onboard camera data.

A-06: WeatherHive - Swarm Drone Atmospheric Sampling

Organization	GreenSight
Principal Investigator	Eli Davis
Technology Readiness Level	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
Research Area of Interest	A) Unmanned Aerial Systems
Funding	Internally

Proposed Experiment Overview

GreenSight would like to conduct an experiment based on this event's sustained operation focus. Our goal is to get as close as we can to continuous operation of our drone based atmospheric sampling and provide real time data. This would include the simultaneous operation of multiple sUAS beyond line of sight, and can extend to night operation as well. The expansive flight envelope we can achieve around McMillan Airfield will help us to test the limits of our system in terms of endurance and flight range. We are also interested in uploading our atmospheric data to a central TOC.

System Description

WeatherHive is a multirotor drone swarm solution for atmospheric sampling and wind measurement within a 10km radius, up to 5km AGL. 10 drones, each with a micro weather sensor, long range radio, and a large battery, are stored and transported inside of a container called the Hive. The Hive is arobotic system that can deploy the drones one by one, and maintain long distance communication with all 10 drones simultaneously. The system iscontrolled wirelessly from a web browser interface.

A-12: GPS-Denied UAV Autonomous Maneuver

Organization	Rhoman Aerospace
Principal Investigator	Thomas Youmans
Technology Readiness Level	TRL 4: Component and/or breadboard validation in laboratory environment.
Research Area of Interest	A) Unmanned Aerial Systems
Funding	Federally and Internally

Proposed Experiment Overview

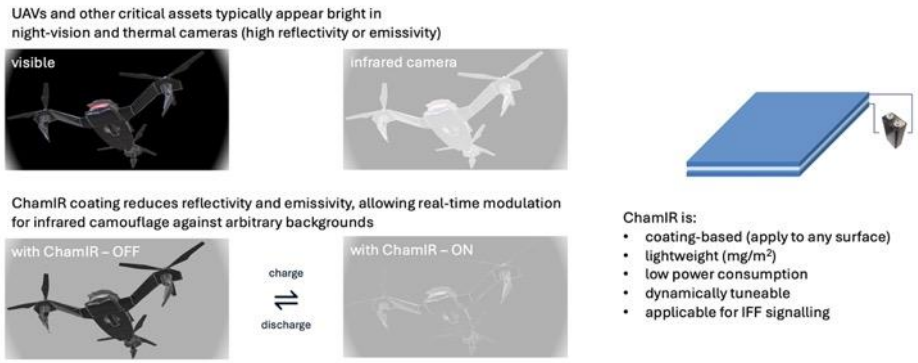
Test multi-camera vision-based, no-emit GPS-Denied UAV autonomous navigation and maneuver systems: fixed-wing Group 2 gathering data and running position estimate algorithms and Group 2 quad UAV performing autonomous pelican-case landings

System Description

The system under test is a modular UAV payload that uses cameras and inertial data estimate a position in a GPS-Denied environment, and calculate maneuver commands to enact any autonomous mission. The system estimates UAV position with only passive sensors - no Lidar or Radar, and does not require pre-loaded terrain maps

An in-development version of the solution deploys via a software upload to UAV

B-02: Advanced Materials for Uncrewed Systems (UxS) Exploitation and Signature Management



Organization	Advanced Material Development
Principal Investigator	Alan Dalton
Technology Readiness Level	TRL 4: Component and/or breadboard validation in laboratory environment.
Research Area of Interest	B) Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Funding	Federally (SOCOM)

Proposed Experiment Overview

This experiment will evaluate the effectiveness of Near-Infrared (NIR) and Mid-Infrared (MIR) signature management coatings for uncrewed systems (UxS) by quantifying their impact on reducing thermal and optical visibility in multispectral surveillance environments. UxS surfaces will be coated with adaptive electrochromic and thermochromic materials, and their emissivity changes will be assessed using IR cameras and hyperspectral imaging. The coatings will be tested under various lighting, temperature, and humidity conditions, with measurements conducted in both outdoor and controlled laboratory settings. Data collection will involve capturing IR images across NIR (0.7,Äì1.4¬µm) and MIR (3,Äì5¬µm, 8,Äì12¬µm) bands, measuring emissivity shifts, and quantifying spectral reflectance reduction using a spectroradiometer. This experiment aims to reduce thermal and optical detectability, enhance multispectral stealth performance, and provide operational adaptability across dynamic environmental conditions. The results will offer actionable insights into advanced signature management for JIFX's UxS experimentation initiatives.

System Description

The core technology of this experiment is an advanced Near-Infrared (NIR) and Mid-Infrared (MIR) signature management coating designed for uncrewed systems (UxS). These coatings incorporate adaptive electrochromic and thermochromic materials that dynamically adjust emissivity and reflectance based on environmental conditions. By modulating thermal and optical signatures, they reduce detection in surveillance environments. The coatings will be evaluated using hyperspectral imaging and IR cameras to measure spectral shifts in NIR (0.7,Äì1.4¬µm) and MIR (3,Äì5¬µm, 8,Äì12¬µm) bands under varying lighting, temperature, and humidity conditions. The results will determine their effectiveness in enhancing multispectral stealth performance for military and defense applications

B-06: Model Validation for Mesh-Enabled Targeting in a GPS-Denied Environment

Organization	U.S. Naval Postgraduate School
Principal Investigator	Oleg Yakimenko
Technology Readiness Level	TRL 5: Component and/or breadboard validation in relevant environment.
Research Area of Interest	B) Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Funding	Federally (NRP)

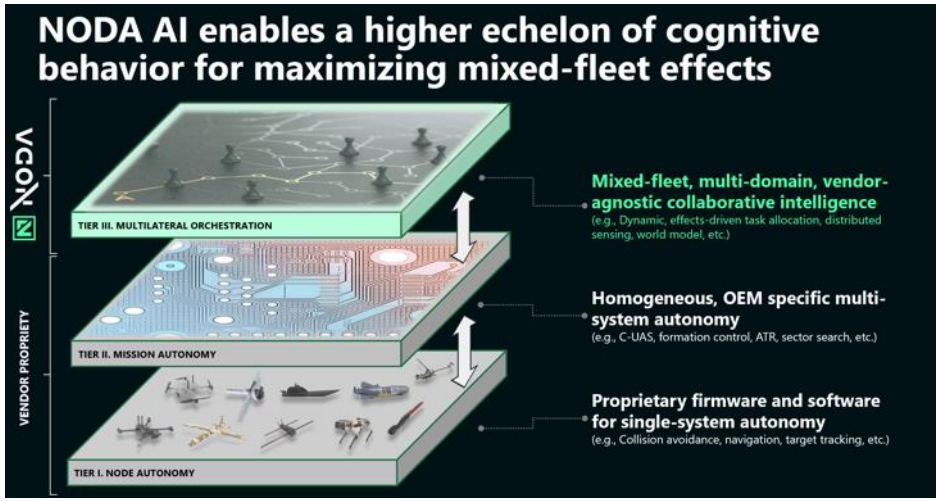
Proposed Experiment Overview

Current adversary jamming and space denial capabilities can disrupt US, allied, and coalition command and control (C2). To continue to achieve strategic objectives in relevant theaters, the Navy/Marine Corps team must continue to innovate in situational awareness and extended-range cooperative targeting. Supporting this objective, we will experimentally validate a model for feasibility of drone mesh networks in enabling a naval task force to organically conduct targeting without satellites (assuming loss of both PNT and communications) and without being detected by adversary sensors.

System Description

Our bespoke UAS consists of several small COTS UAVs, namely Dreamer UAVs manufactured by GreenSight Ag, modified with COTS IP MANET radios manufactured by Rajant Communications, and a COTS GCS. NPS faculty researchers integrated these components into a cohesive multi-vehicle UAS with assistance from manufacturer SMEs. The UAS architecture is open and extensible, enabling rapid integration of autonomy software. For this event, we will actively collaborate with other participants, namely Gambit AI and GreenSight Ag, to explore integration fo advanced autonomy. This system will serve as a surrogate platform for validating our model for mesh-enabled local-area targeting.

B-07: Mixed-Fleet Autonomous System Command and Control Platform



Organization	NODA AI, Inc
Principal Investigator	David Corbett
Technology Readiness Level	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
Research Area of Interest	B) Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Funding	Internally

Proposed Experiment Overview

This experiment will evaluate the performance of AI agents within NODA AI's Urza Command and Control Platform (C2P) in a simulated multi-domain contested logistics scenario. Using a simulation environment, the experiment will replicate the coordination of unmanned aerial (UAS), surface (USV), and underwater (UUV) systems to execute a resupply mission while responding to dynamic threats. (All unmanned systems will be simulated.)

Success Criteria:

Autonomous Decision-Making: AI agents must dynamically detect threats and recommend mission adjustments in real time.

Multi-Domain Synchronization: Simulated UAS, USVs, and UUVs must execute coordinated tasks based on AI-driven tasking.

Mission Adaptability: Urza C2P must successfully modify resupply objectives in response to emerging threats.

User Oversight & AI Performance: The system must provide interpretable recommendations, allowing the operator to accept, reject, or modify AI-driven decisions.

This experiment will help validate Urza C2P's AI-driven battle management capabilities and lay the groundwork for future operational deployments.

System Description

NODA AI's technology solves challenges associated with command and control of multi-domain, multi-vendor autonomous systems through a novel Agentic AI approach that leverages finely tuned AI agents. As an independent aggregation and orchestration layer, NODA AI provides a vendor-agnostic approach to optimize mission requirements, continually assess available assets and their capabilities, integrate with use-case-specific algorithms, and dynamically generate vendor-specific tasking code in real-time using AI, tasking frameworks, and MILP solvers.,ÄØ

NODA AI's solution:

Bridges existing siloes through an independent UxV integration framework, a vendor-agnostic tasking framework, and AI Agents that can dynamically generate vendor-specific commands.

Provides an independent orchestration solution that leverages best-in-class OEM vehicles and capabilities in algorithmic collaboration to achieve complex battlefield effects.

Delivers the flexibility and scalability required to win in unpredictable battlefield environments.

Establishes new user experience paradigms that leverages AI to reduce cognitive load and reduce the human-to-machine ratio.

B-09: FieldFab Expeditionary 3D Printer

Organization	Craitor Inc.
Principal Investigator	Eric Shnell
Technology Readiness Level	TRL 8: Actual system completed and qualified through test and demonstration.
Research Area of Interest	B) Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Funding	Internally

Proposed Experiment Overview

Craitor's planned experiment allows and trains personnel and warfighters to utilize Point of Need Manufacturing. Additionally, unique parts will be tested to manufacture via an interconnected part file distribution system in the field. This supports UxS sustainment with a software workflow enabling training of non-Subject Matter Experts to understand and begin a print in under 15 minutes. The data collection plan involves assessing a warfighters level of knowledge/experience with 3D printing aiming for a low level of subject matter expertise, train them to print a part via a Technical Data Package of a UxS body, assess the warfighters learnings, convene for a Quality Assurance check on the printed drone body, then reassess the warfighters learnings. This experiment allows for both qualitative and quantitative metrics to be obtained for the process of 3D printing for UxS sustainment in areas of contested focusing on the operator experience and digital manufacturing workflow.

System Description

FieldFab is a rugged, expeditionary 3D printer developed by Craitor to meet the needs of manufacturing mission-critical parts in austere environments. Designed for use in challenging conditions such as extreme temperatures, high humidity, shock, and vibration, FieldFab supports the production of military-grade parts with high temp FDM and a heated chamber: printing ULTEM, Nylon-CF, TPU, PETG, etc. The system is certified to MIL-STD-810H standards, ensuring its reliability and durability in field conditions. FieldFab enables point-of-need manufacturing by incorporating the Sentinel software and SmartTDP system, which automates the 3D printing process through a smart technical data package (TDP) that sets critical profile data. This capability enables the customization of equipment for mission requirements, and the printing of sensors, and drones/ SUAS solutions. By creating a digital, on-demand supply chain ecosystem, FieldFab enhances operational readiness and flexibility, allowing warfighters to quickly produce necessary parts and maintain their equipment in the field.

B-11: Phalanx Shield Multi-Domain Sensor System

Organization	Innovative Algorithms
Principal Investigator	Jay Chestnut
Technology Readiness Level	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
Research Area of Interest	B) Unmanned Systems (UxS) Design, Deployment, Operation, Networking and Control
Funding	Internally

Proposed Experiment Overview

Experiment will test the Phalanx Shield tactical gateway capabilities, communications characteristics and endurance, as well as the capabilities of additional sensors under development, and their integration into the overall Phalanx Shield system.

System Description

Phalanx Shield sensor system as integrated with the tactical gateway and several additional experimental sensors

C-03: Low SNR, High Clutter UAS Detection and Tracking

Organization	Special Technologies Laboratory
Principal Investigator	Ian McKenna
Technology Readiness Level	TRL 3: Analytical and experimental critical function and/or characteristic proof of concept.
Research Area of Interest	C) Countering Unmanned Systems
Funding	Internally

Proposed Experiment Overview

STL proposes to collect ground-based imagery data of various UAS platforms in flight

System Description

This experiment utilizes standard commercial off the shelf video cameras (FLIR Blackfly or similar) to record imagery data at up to 60 FPS from a fixed ground location

C-04: Archimedes Laser System

Organization	Aurelius Systems
Principal Investigator	Michael LaFramboise
Technology Readiness Level	TRL 5: Component and/or breadboard validation in relevant environment.
Research Area of Interest	C) Countering Unmanned Systems
Funding	Internally

Proposed Experiment Overview

Testing the Archimedes laser system against moving drones at continuing distance

System Description

An edge deployed autonomous Directed Energy Weapon Laser system, utilizing a 5-10 kw laser, specifically designed to track and engage group one and group two drones.

C-05: DroneSentry-X Mk2 Integrated C-UAS Detect, Classify, Locate, Defeat

Organization	DroneShield LLC
Principal Investigator	Jamie Wang
Technology Readiness Level	TRL 9: Actual system proven through successful mission operations.
Research Area of Interest	C) Countering Unmanned Systems
Funding	Internally

Proposed Experiment Overview

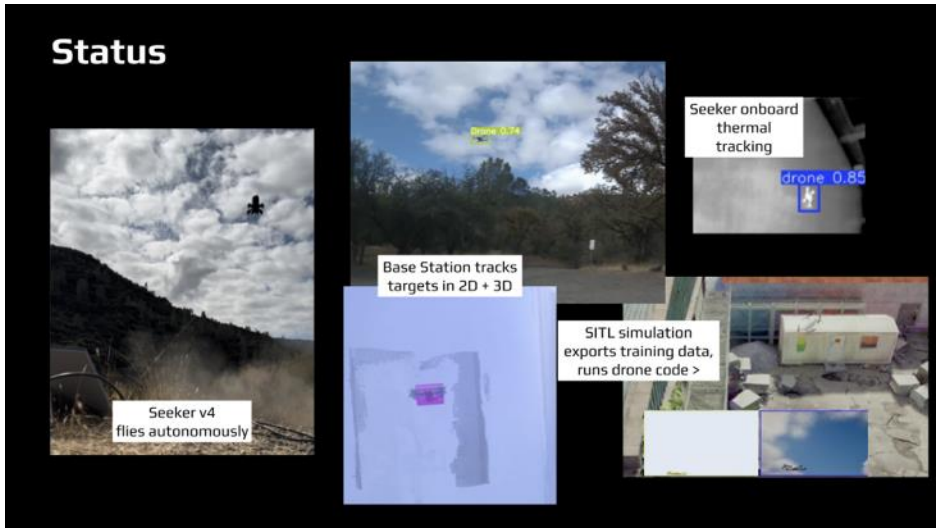
DroneSentry-X Mk2 will be demonstrated in its Expeditionary Fixed Site configuration, mounted on a mast with RF sensing. We aim to measure its effectiveness in detecting, tracking, classifying, and (if permitted) defeating red-team UAS. Integration of detections into TAK/ATAK will also be demonstrated.

System Description

TRL-9 DroneSentry-X Mk2 (DS-X Mk2) is an automated, fully integrated, 360-degree, hemispheric protection system that detects, classifies, tracks and defeats UAS (and other signals of interest with multi-mission capabilities). Its RF sensor and effector are equally effective against single, multiple, or swarms of drones. Its nominal detection range is 4+ km, indicating the bearing to the drone within eight sectors, with a defeat range exceeding 500 m. In 2024 field trials, DS-X Mk2 achieved reliable detections to a range of 15 km.

If vehicle- or vessel-mounted, DS-X Mk2 protects while on the move. An Expeditionary Fixed Site (EFS) kit provides everything needed to pop up the base system without tools in under 10 minutes for immediate fixed-site protection in the field.

C-08: Mara: Automated CUAS Threat Detection and Countermeasures



Organization	Mara Solutions, Inc.
Principal Investigator	Jiarun Chen
Technology Readiness Level	TRL 4: Component and/or breadboard validation in laboratory environment.
Research Area of Interest	C) Countering Unmanned Systems
Funding	Internally

Proposed Experiment Overview

Mara Solutions will test the Spike system, a ground-based CUAS sensor platform (that tracks IR, visual, audio, thermal, radar, software-defined radio), alongside the Seeker, a high-speed Group 1 autonomous CUAS kinetic interceptor, at JIFX 25-3. The experiment aims to confirm Spike's ability to autonomously detect and track simulated CUAS threats and direct Seekers to intercept them. Key metrics include: 1) distance at detection, 2) distance from launch to intercept, 3) time to detection, 4) time to intercept, and 5) Seeker intercept proximity to target (targeting sub 1 meter between Seeker and threat). Conducted at Camp Roberts, this live demo will validate the system's speed, accuracy, and capacity to neutralize swarm drone threats in real-time with minimal operator intervention, aligning with JIFX's focus on automated countermeasures and situational awareness. Results will refine Mara's low-cost, EW resilient CUAS solution for DoD and DHS applications.

System Description

Mara Solutions' experiment tests the Spike and Seeker systems, an integrated counter-UAS technology. Spike, a compact ground station, employs advanced sensor fusion,ÄîIR, visual, thermal, audio, radar, and software-defined radio,Äîpowered by 275 TOPS of compute and AI autopilot for autonomous threat detection and tracking. With 210 meters vertical visibility and 100 meters horizontal coverage, it's jam-resistant, non-GPS reliant, and mountable on vehicles or static platforms. Seeker, a Group 1 UAS, features a low-cost airframe, an optional APCP rocket booster, and a thermal camera, achieving 200 mph speeds and 2 km range. Spike's real-time data directs Seeker to intercept drones with precision (sub .5 meter proximity). This scalable, economic system leverages COTS components and modularity for rapid production and deployment, offering a robust, autonomous defense against UAS threats.

D-04: LiFi (Data transfer)

Organization	Stucan Solutions Corp
Principal Investigator	Stuart Taylor
Technology Readiness Level	TRL 9: Actual system proven through successful mission operations.
Research Area of Interest	D) Communication and Networking
Funding	Internally

Proposed Experiment Overview

LiFi is not vulnerable to eavesdropping through walls or tent canvas and is highly resistant to even close range jamming attempts. Designed to counter insider threats, data transmitted is only available to the right people in the right place.

LiFi can enable highly secure wireless coverage for a VIP user on the go or for buildings of convenience.

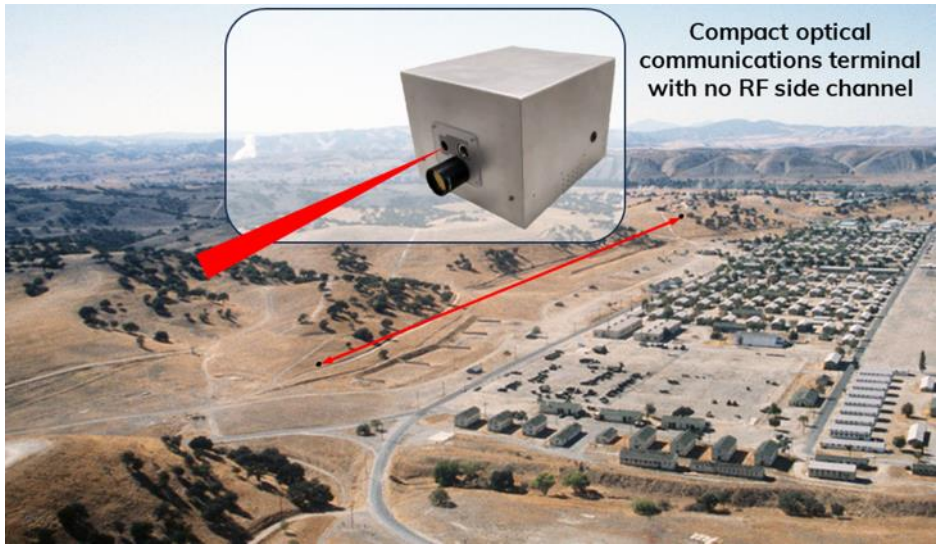
LiFi does not penetrate walls or leak through material such as canvas or curtains therefore can be contained in a space eliminating the risk of interception or detection.

LiFi allows for the easy deployment of co-located enclaves without cross contamination of information.

System Description

LiFi is a mobile wireless communications technology that uses light rather than radio frequencies to transmit data. LiFi is fully networked, and mobile. The experience of using LiFi is similar to WiFi but offers a range of advantages. Similar to other wireless communications technologies, LiFi can be used in a variety of applications such as internet access, phone-2-phone or phone-to-TV communications or in emerging use cases such as extended or mixed reality.

D-10: Long range free space optical communications



Organization	Intellisense Systems, Inc.
Principal Investigator	Marc SeGall
Technology Readiness Level	TRL 5: Component and/or breadboard validation in relevant environment.
Research Area of Interest	D) Communication and Networking
Funding	Federally (US Navy)

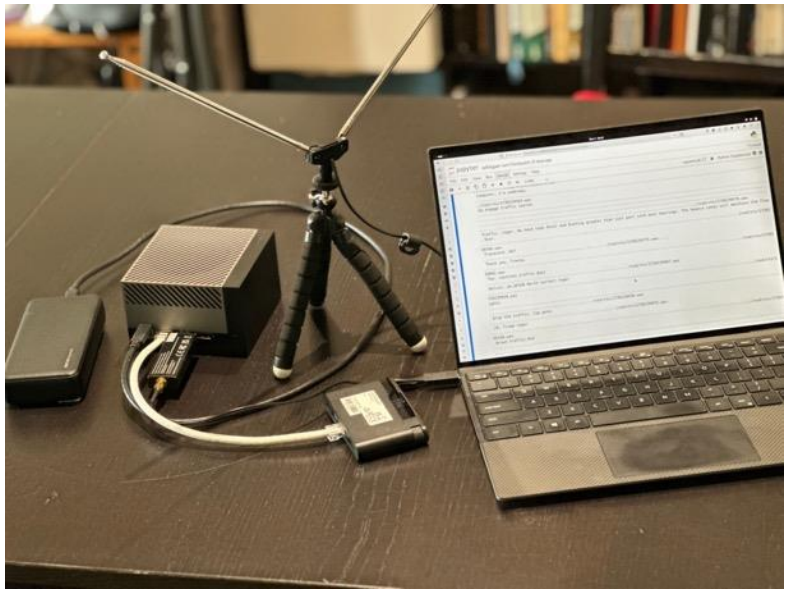
Proposed Experiment Overview

Intellisense plans to position two free space optical transceivers at a fixed distance more than 1 km from one another and place anemometers at various points along the link path to monitor the local turbulence. The temperature and humidity will also be monitored. After recording an initial set of atmospheric parameters, the two transceivers will be activated and monitored to observe whether they automatically establish a communications link using only optical methods, as intended. The transceivers will then transmit data, and the traffic monitored to determine the error packet rates. The transmission power of the transceivers will then be reduced in successive increments, each time monitoring the packet error rate and the atmospheric parameters. These tests will enable Intellisense to verify that a transceiver can automatically lock onto and establish a link with another transceiver and establish the expected performance range under field conditions.

System Description

The technology is a compact (1 cu. ft) free space optical communications (FSOC) system that automatically locks onto and tracks other transceivers without requiring an RF side channel. It is designed for minimal size, weight, and power and for mounting on Group 2/3 UAS platforms. It can achieve full-duplex data rates of up to 1 Gbps at an eye-safe wavelength of 1550 nm. Based on laboratory testing, it can achieve link ranges of up to 47 km under clear, low turbulence conditions. Its operating time is 1.8 hr (scalable to longer times with a larger battery).

D-12: Automating Critical Operations using Gen AI



Organization	Denoise (previously Pavati Solutions)
Principal Investigator	Jeremy Schoos
Technology Readiness Level	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
Research Area of Interest	D) Communication and Networking
Funding	Internally

Proposed Experiment Overview

This experiment will evaluate the effectiveness of our radio voice message to workflow automation tool in a DoD field environment. The system will ingest real-time radio communications from soldiers, transcribe them with noise reduction, and convert them into structured data for seamless integration into a next-generation command and control (C2) platform.

To measure performance, we will track word error rate (WER) in transcriptions and compare time saved in processing and actioning messages versus manual logging methods. Data collection will include transcription accuracy, response latency, and operator workload reduction, assessing improvements in situational awareness and decision-making speed.

Success will be defined by a lower WER, reduced manual input time, and increased workflow efficiency, demonstrating how automation can enhance operational effectiveness in high-tempo military environments.

System Description

Our system converts radio voice messages into structured data for seamless integration into command and control workflows,Äîall in a self-contained platform that operates without an internet connection and requires low power. It features a custom noise reduction algorithm that enhances speech clarity before processing through a speech-to-text pipeline. A fine-tuned language model then performs entity extraction, identifying key information such as locations, unit identifiers, and operational tasks.

The extracted data feeds into our workflow automation tool, a durable and resilient application designed to assist human operators in operations centers. By reducing manual transcription and data entry, our system accelerates decision-making, enhances situational awareness, and improves operational efficiency, even in disconnected, resource-constrained environments. The system is self contained with no internet connection required.

D-14: Distributed Tactical Radio Based Jammer Detection, Threat Library Creation, Cancellation

NEW Jammer Detection and classification SIGINT tool

Key features:

- Identify Jammers
- Learning engine to classify new threats
- Build your own library with embedded AI engine
- SW add-on to existing Silvus Streamcasters

Organization	Silvus Technologies
Principal Investigator	Mansour Rachid
Technology Readiness Level	TRL 4: Component and/or breadboard validation in laboratory environment.
Research Area of Interest	D) Communication and Networking
Funding	Internally

Proposed Experiment Overview

Silvus Technologies will test two functions that leverage the SoC architecture in the Streamcaster Radios. The first MAN-IQ will experiment detecting and categorizing jamming types. The system will leverage an AI learning engine to create new EW threat libraries. The other feature to be tested will be an interference cancellation. We will measure the data rates as the higher SNR jamming is applied to test effectiveness

System Description

The Mobile Area Network (MAN)-IQ is embedded software in development, that conducts spectrum scanning while the radio is operating as part of the MANET network. It captures the characteristics of different emitter and relates them to a broad classes of jamming types. Then it relates to the building threat library. The MAN-IC uses nulling techniques to reduce the sensitivity to the noise. We will measure the effectiveness before and during emitter tests.

E-03: Secure Data and Communication

Organization	Aronetics
Principal Investigator	John Aron
Technology Readiness Level	TRL 3: Analytical and experimental critical function and/or characteristic proof of concept.
Research Area of Interest	E) Cyber, Cyber Security, and Electronic Warfare
Funding	Internally

Proposed Experiment Overview

What type of experimentation is acceptable to deter adversaries from networks? As an adversary inside the network breached our 10 U.S. Code ¬ß 394 - Authorities concerning military cyber operations, an adversarial attack is either an operator mistake, malicious actor, or worse an exploited zero day, what type of action is acceptable?

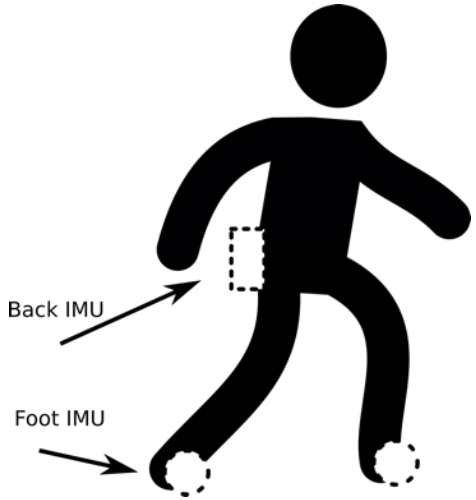
System Description

As the first tenant of Zero Trust in cybersecurity is to ‚Äúassume breach,‚Äù the current offerings from industry have left us with generations of stolen identities by malicious actors because each technology available on the current market is exploitable.

Thor is a new low-level technology added to the existing system kernel to recognize normal versus abnormal system behaviors and known versus unknown operations that exfiltrate your data from known or unknown holes in the software. This technology has critical national security importance as it deters, defends and disrupts adversarial activities. Aronetics¬Æ built Thor‚Ñ¢. Red Hat¬Æ certified it.

Aronetics' technology provides an unlimited-purpose-driven design that delivers a multi-service function. Thor‚Ñ¢ is a cross-domain solution for public and private organizations, either in-premise or in virtualized architectures, in containers on the virtualized architecture or on-premise. Thor‚Ñ¢ is the only technology that does not provide an illusion of stability or security.

E-04: Machine Learning Aided Gait Recognition for Inertial Navigation and Orientation (MARIO)



Organization	Naval Information Warfare Center Pacific (NIWC Pacific)
Principal Investigator	Minhdao Nguyen
Technology Readiness Level	TRL 5: Component and/or breadboard validation in relevant environment.
Research Area of Interest	E) Cyber, Cyber Security, and Electronic Warfare
Funding	Federally (Office of Naval Research)

Proposed Experiment Overview

The experiment is to collect user's IMU, position, velocity, and orientation data and test a GPS-denied pedestrian navigation system called the MARIO system. The collected data would be used as training data for the machine learning portion of the system. Data would be collected from several users at the experiment. The MARIO equipment will comprise of a backpack unit, 2 feet units, and smartphone. The backpack unit will be mounted on the back of the user. The 2 feet units would be attached to the shoe laces on the user's shoe. One feet unit for each shoe. The smartphone would be used to visualize data and connect the ground truth system with GPS correction data. The user would walk around the test area for 10 to 45 minutes. The data would be saved onto the equipment.

System Description

The MARIO system is a GPS-denied pedestrian navigation system that uses machine learning and wearable IMUs. The machine learning is used to estimate the user's velocity from wearable IMU modules. The estimated velocity is combined with a back mounted IMU and an Extended Kalman Filter to estimate position. Data would be collected from multiple different users to train the machine learning algorithm to estimate any user's velocity.

E-05: Maxar x Inertial x Firestorm

Organization	Maxar Intelligence
Principal Investigator	Micah Schicker
Technology Readiness Level	TRL 7: System prototype demonstration in an operational environment.
Research Area of Interest	E) Cyber, Cyber Security, and Electronic Warfare
Funding	Internally

Proposed Experiment Overview

Maxar, along with partners Inertial Labs and Firestorm, demonstrate robust drone operations in a GPS-denied environment. We use a multi-tiered position and navigation approach including Maxar's vision-based positioning software ,ÄúPinpoint3D.,Äù Using Maxar's 3m accurate Precision3D data as a foundational reference, we show the vision-based positioning maintains absolute position within 20m (90th percentile) from true 3D position. With this accurate drone position, drones successfully perform reconnaissance, strike and other missions regardless of EW challenges.

System Description

Inertial Labs' Inertial Navigation System (INS), Firestorm's Tempest UAS, and Maxar's Pinpoint3D are the underlying capabilities at the core of this experiment. PinPoint3D is a visual aiding algorithm that can estimate a UAS' absolute position by comparing captured terrain imagery to an on-board 3D map. The data is provided as aiding data to the onboard INS' Kalman filter, which is a real-time sensor fusion algorithm.

F-03: Attritable LoRa Mesh Network for Low-Cost C5ISR

Organization	Balboa A.L.S.
Principal Investigator	Tony Frissore
Technology Readiness Level	TRL 5: Component and/or breadboard validation in relevant environment.
Research Area of Interest	F) Intelligence, Surveillance, and Reconnaissance (ISR)
Funding	Internally

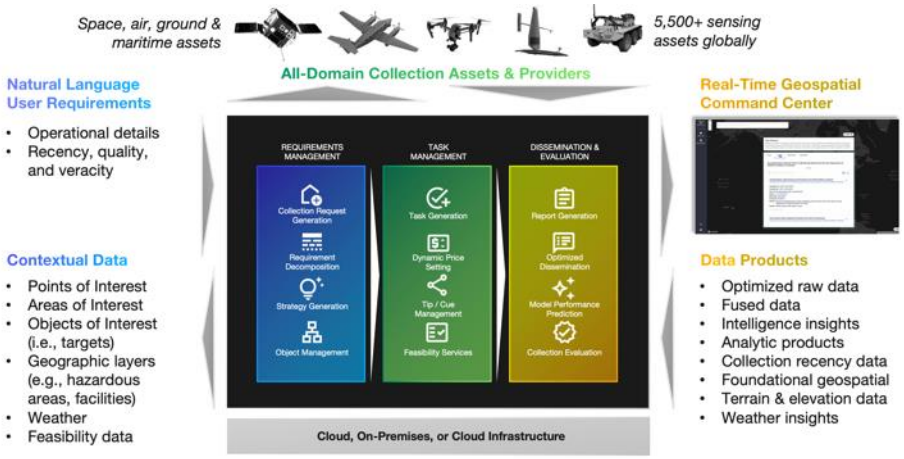
Proposed Experiment Overview

The proposed experiment will demonstrate our mesh network's ability to provide resilient, long-range communication and RF sensing in a maritime environment. Utilizing 5 nodes deployed across a 30-square-mile area of open ocean, the experiment will test the system's capacity to maintain connectivity in GPS-denied and contested conditions. Each node will detect, geolocate, and transmit simulated RF signals of interest to a centralized hub, where AI algorithms will process and prioritize data for actionable insights. The experiment will also evaluate the network's scalability, response to environmental challenges, and integration with existing ISR platforms. Key performance metrics include connectivity reliability, RF detection accuracy, data latency, and power efficiency. Data will be collected via onboard logs and real-time monitoring tools, enabling comprehensive analysis of network performance. This experiment will validate the system's operational utility for enhancing situational awareness and communications across vast and contested maritime domains.

System Description

Our system is a low-cost, resilient LoRa mesh network designed for maritime and austere environments, offering robust communication and RF sensing capabilities. Each node is a compact, ruggedized device equipped with RF sensors, LoRa transceivers, and optional AI-driven processing for detecting, geolocating, and analyzing signals of interest. The system forms a self-healing, scalable mesh network, enabling reliable beyond-line-of-sight (BLOS) communication in GPS-denied or contested environments. The system integrates seamlessly with existing ISR platforms, enhancing situational awareness and operational effectiveness. Its low-SWaP-C (Size, Weight, Power, and Cost) design allows for mass deployment across vast areas, with each node capable of transmitting critical data to a centralized hub for real-time decision-making. Tailored for both military and civilian use, it supports applications ranging from ISR and maritime domain awareness to disaster recovery, making it a versatile solution for addressing complex challenges in challenging environments.

F-06: Optimized Collection Planning & Execution in Austere Domains



Organization	Kestrel Intelligence, Inc.
Principal Investigator	Remington Barrett
Technology Readiness Level	TRL 5: Component and/or breadboard validation in relevant environment.
Research Area of Interest	F) Intelligence, Surveillance, and Reconnaissance (ISR)
Funding	Internally

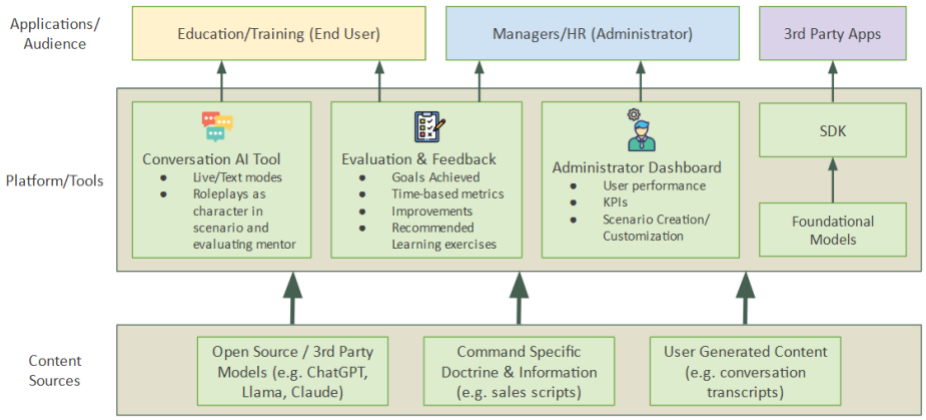
Proposed Experiment Overview

Kestrel proposes to test its collection optimization system against the JIFX exercise, Camp Roberts, and the main NPS Campus against simulated intelligence targets related to the broader exercise. This includes: (1) operation of Kestrel's software on a field-deployed edge device exhibiting real or simulated denied, disrupted, intermittent, and limited bandwidth environment; (2) evaluation of new approaches to broad area surveillance (BAS) optimization through novel search algorithms against the vast areas and activities in the JIFX exercise, including real or simulated environmental interference (e.g., electronic warfare, weather, etc.); (3) and layering of multiple overhead (i.e., satellite) collection providers. The goal will be to evaluate the potential information gain derived from software optimization of collection assets in a dynamic environment with many subjects of interest, types of interference, and other effects of an austere environment.

System Description

Kestrel's software is a geospatial command center used to plan, optimize, execute, evaluate, and disseminate collection from multiple providers and phenomenologies. Kestrel's software can be operated as an end-to-end system or integrated into existing systems in the form of 12 modular software services. Kestrel has a large, existing network of and integration with data provider partners in multiple phenomenologies, including electro-optical, synthetic aperture radar, and radiofrequency. Kestrel built this system to: (1) increase timeliness and accuracy of commercial geospatial data collection; (2) optimize existing collection schedules, including of government-owned assets, that are full in some times and places and empty in others; (3) make intelligence planning easier, faster, and scalable against thousands of targets with thousands of sensors; (4) increase the collection of multi-domain, multi-phenomenology data.

G-03: AI-Enabled Role Player Training



Organization	Delta Learning Inc
Principal Investigator	Mark Buonforte
Technology Readiness Level	TRL 4: Component and/or breadboard validation in laboratory environment.
Research Area of Interest	G) Situational Awareness
Funding	Internally

Proposed Experiment Overview

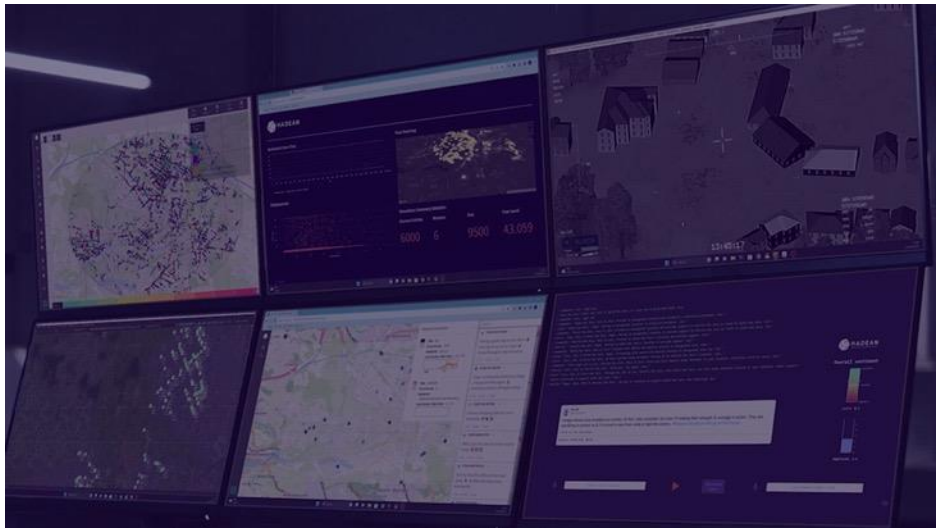
Effective training often struggles to replicate real-world scenarios in a way that'a engaging and adaptable to specific needs. My experiment focuses on addressing this challenge by showcasing Delta AI's prototype, AI-powered, scenario-based training interactions that are tailored for SOCOM and Leadership training. The experiment invites attendees to engage with the scenario and provide real-time feedback on how the system can adapt to meet situation-specific requirements. This hands-on involvement will not only demonstrate the flexibility and effectiveness of Delta AI's technology but also gather insights on areas for improvement. Additionally, the experiment aims to explore potential applications of Delta AI across other functional areas, identifying how our AI-enabled role players can become valuable assets to the DoD and be tailored to achieve whatever training or learning objectives are desired. The ultimate goal is to refine our solution and uncover broader opportunities for collaboration.

System Description

Delta AI's training platform allows trainees to simulate realistic, high-impact conversations using an AI agent. We leverage Large Language Models (LLMs) along with text-to-speech (TTS) and speech-to-text (STT) models to produce an AI agent that can listen, think, and speak to the trainee in real-time. Once a trainee completes a scenario, an LLM evaluates the trainee's performance and provides instantaneous and consistent feedback based on a custom rubric.

We leverage LLMs to serve two purposes: providing the trainees with 1) the ability to role-play a persona in a live scenario, and 2) a mentor that evaluates the member's performance and recommends new training exercises to improve areas of weakness. We are able to accomplish this by developing a modular ecosystem of LLM prompts that are refined and evaluated for efficacy and consistency.

G-05: Hadean - AI-powered Spatial Computing Platform



Organization	Hadean Software Inc.
Principal Investigator	Eddie Aspden
Technology Readiness Level	TRL 8: Actual system completed and qualified through test and demonstration.
Research Area of Interest	G) Situational Awareness
Funding	Internally

Proposed Experiment Overview

We intend to integrate 2 or more inputs from live data systems (industry partners contributing to the JIFX experiment), alongside NPS' cursor-on-target/TAK server, producing a common operating picture, which will provide situational awareness to the user.

We will use this data to provide a real-time common operating picture (COP), using 2D and 3D visualizations, to both analysts on the ground in Camp Roberts and on to commanders at distributed headquarters, as appropriate within the resources and confines of the experiment.

The COP will be augmented with constructive/synthetic data, generated by Hadean's simulation, such as simulated aircraft, population, and cyber layers.

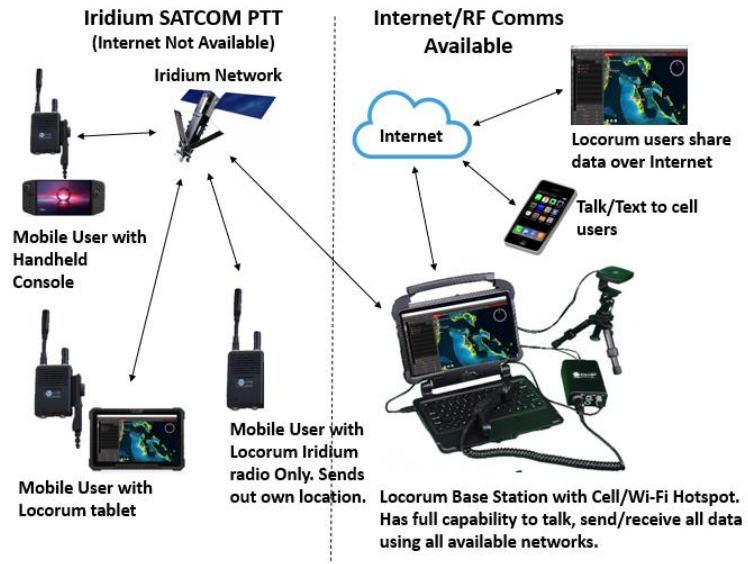
We will use Hadean's predictive capabilities to simulate sensor data forwards in time, to produce a predictive situational awareness, and automate COA recommendation/analysis.

System Description

Hadean's AI-powered spatial computing platform agnostically integrates and orchestrates data in real-time into a multi-domain/-system/-level common operating picture.

Integration of new and existing capabilities will be done using industry standards like DIS, HLA, and cursor-on-target. For those that do not utilize those standards, we provide third party support via APIs for direct integration. The focus of integration is to be agnostic to data formats and provide an openly extensible structure to enable modern and legacy application capabilities within 3D visualization engines for the synthetic wrap to add training value and context to enable contextual AI informed decision-making and capability development.

H-02: Dual-Use C2/SA for Global Coordination and Emergency Management



Organization	DeVilliers Technology Solutions LLC
Principal Investigator	Edward DeVilliers
Technology Readiness Level	TRL 7: System prototype demonstration in an operational environment.
Research Area of Interest	H) Defense Support to Civil Authorities (DSCA)
Funding	Internally

Proposed Experiment Overview

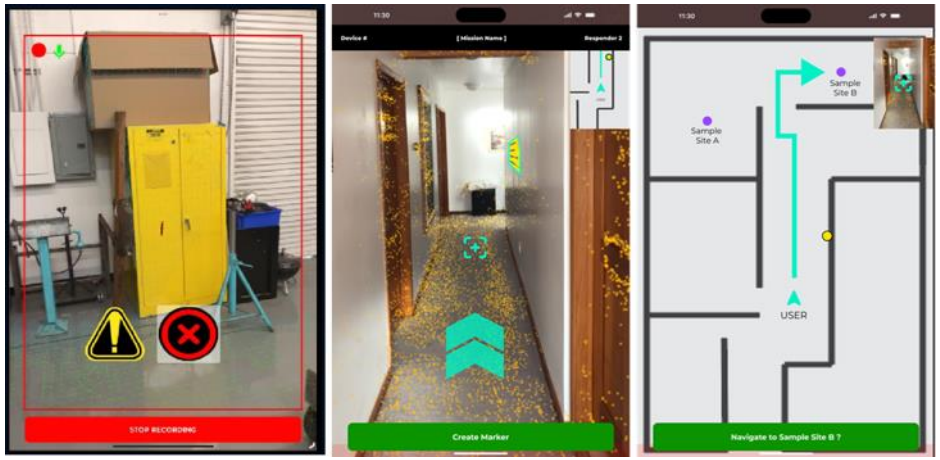
Show the use of Global, commercial Iridium SATCOM and available cell networks to provide C2/SA usable by military and civil authorities, especially in geographically dispersed operations (e.g. Indo-Pacific region), as well as emergency/disaster operations when communications infrastructure is not available. This will be demonstrated for the three use cases of foot-mobile operators, vehicle-based operators, and operations center operators. This will be accomplished with our Locorum C2/SA system which is cross-platform (Linux and Windows), internationalized, and secure using a zero-trust Linux distribution from IGEL inc.

The test measurement will be success/failure of functional cases to show system usefulness. This includes passing Position/Location Information (PLI), targets, waypoints, routes, overlays, and chat messages, in multiple languages. The system maintains logs of all data going in/out of the system, and that will be used to collect data and measure the success rate between nodes.

System Description

The experiment is focused on our system called Locorum. It is a peer-to-peer, cross platform and internationalized application that can run on Windows or Linux, x86 or ARM processors. It is designed to scale from a few nodes to tens of thousands of data nodes being tracked in a 2D/3D map display. The hardware base to be used will be a mix of game consoles, laptops, and server-based installations to show its utility for various user groups. The third major component is a novel Iridium data/voice radio that can transmit data via Push-To-Talk (PTT) efficiently. It is the only Iridium communications device that allows software, other than developed by Iridium itself, to be transmitted via PTT. PTT is very cost effective. The fourth component is the use of the IGEL zero-trust Linux distribution, showing increased security while being to mix thin client with resident application use.

H-03: Localization and Mapping Artificial Intelligence Application (LAMA) for Disaster Response



Organization	Holochip Corporation
Principal Investigator	Robert Batchko
Technology Readiness Level	TRL 6: System/subsystem model or prototype demonstration in a relevant environment.
Research Area of Interest	H) Defense Support to Civil Authorities (DSCA)
Funding	Federally (EPA SBIR Phase II)

Proposed Experiment Overview

Two users in the roles of disaster response team members employ Holochip's Localization and Mapping Artificial Intelligence Application (LAMA) to validate LAMA's features in disaster response and related operations. A first team member, the Responder, carries an Apple iPad while a second team member, the On-Scene-Coordinator, (OSC) coordinates the response operation from a laptop computer. The Responder uses LAMA on their iPad to i) map the disaster site; ii) identify objects with AI; iii) place markers and notes at relevant locations; iv) receive OSC- and AI-generated navigation instructions; and v) communicate this data with the OSC's laptop in real time via local Wifi. LAMA enables the OSC to i) view and interact with the map, markers, and detected objects received from the Responder's iPad; and ii) communicate with Responder through their iPad, all in real time. Performance data on these functionalities is measured and collected on the iPad and laptop.

System Description

LAMA is an app developed by Holochip under an Environmental Protection Agency (EPA) SBIR Phase II program to assist disaster response teams during response operations. These operations present challenges in unknown or rapidly changing environments. Effective operations require the ability to generate 3D maps of large sites, update and share those maps instantly among the team, navigate sites efficiently and safely, track team members' locations, identify hazards, and coordinate efforts with the OSC through seamless communication, all in real time. LAMA can benefit DoD operations such as Defense Support to Civil Authorities and warfighter teams, who require a common operational picture. LAMA's shared maps and data, intuitive augmented (AR) display, and AI object identification can accelerate users' Data to Decision (D2D) and reduce attentional/cognitive load. This experiment involves two users, but LAMA supports an arbitrary number of Responders and facilitates improved distributed situational understanding of all users.

L-01: Resilient Resupply of Temperature Sensitive Goods

Organization	Artyc
Principal Investigator	Sandor Langer
Technology Readiness Level	TRL 8: Actual system completed and qualified through test and demonstration.
Research Area of Interest	L) Mobility and Transportation
Funding	Internally

Proposed Experiment Overview

We will evaluate the Medstow 5L container's ability to actively cool and stabilize internal temperatures for sensitive goods under simulated transit conditions. At JIFX, the container will be subjected to controlled temperature fluctuations, vibrations, and shocks that mimic real-world transportation challenges. Equipped with an active cooling system, the MedStow 5L continuously monitors internal conditions via embedded sensors, which log temperature, humidity, and shock data in real time. The cooling system automatically adjusts its output to maintain optimal temperatures based on sensor feedback. We will compare the container's cooling performance against established pharmaceutical and agricultural shipping standards and conditions that would be expected in military distribution environments. This data-driven analysis will quantify the active cooling system's efficacy in preserving product integrity and inform further enhancements for resilient, mobile cold-chain logistics.

System Description

The Medstow 5L is an advanced insulated container engineered for the resilient, active cooling of temperature-sensitive goods. At its core, an active cooling system dynamically reduces the internal temperature to counteract external heat, ensuring a consistent, regulated climate. Embedded IoT-enabled sensors continuously monitor temperature, humidity, and mechanical shocks, with real-time data logging and transmission for performance tracking. The container's rugged design withstands the rigors of dynamic transportation environments while optimizing energy consumption. Compact and portable, the Medstow 5L is ideally suited for modern cold-chain logistics with pharmaceutical, biomedical, and agriculture payloads.

M-01: Transforming Narrative Intelligence into Actionable Insights

Organization	Clara Copilot
Principal Investigator	Alex Moffitt
Technology Readiness Level	TRL 4: Component and/or breadboard validation in laboratory environment.
Research Area of Interest	M) Precision strike, Non-Lethal Weapons, Information Operations
Funding	Internally

Proposed Experiment Overview

The experiment will focus on testing Clara Copilot AI's ability to analyze real-time narratives, track the number of sources contributing to each narrative, and provide recommended courses of action. We aim to assess how the platform's monitoring and analysis capabilities evolve as multiple sources contribute to a narrative. The test will simulate real-world scenarios, where Clara Copilot must identify the primary sources influencing the narrative, provide a confidence score for each, and issue targeted recommendations tailored to specific operational areas. The experiment will evaluate the effectiveness of the platform's narrative breakdown, sentiment analysis, and actionability of insights to determine how Clara Copilot can support decision-makers in addressing complex, fast-moving situations. The results will be used to refine the platform's real-time feedback and enhance its capabilities in managing and responding to emerging digital dynamics.

System Description

Clara Copilot is an advanced AI-driven web-based SaaS platform designed to analyze real-time open and closed-source data. It monitors digital landscapes in real-time, including social media, news outlets, blogs, and public forums, to track evolving narratives. The system assigns a confidence interval to assess the veracity of the narrative, helping decision-makers differentiate between factual content and potential misinformation. It also performs vulnerability and gap analysis to identify risks and provides actionable insights for swift responses. Clara Copilot highlights source origins, monitors shifts in public sentiment, and tailors recommendations to specific operational needs. This technology equips decision-makers with actionable, data-driven insights to manage dynamic, fast-changing situations with clarity and confidence.