DARACK RESEARCH

Operation Eagle Claw and Darack Research Systems Genesis

A detailed examination of the mission revealed an operational element that would serve as the basis for a lineage of successfully-demonstrated Darack Research unmanned capabilities

Ed Darack - Darack Research Founder

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INTRODUCTION:

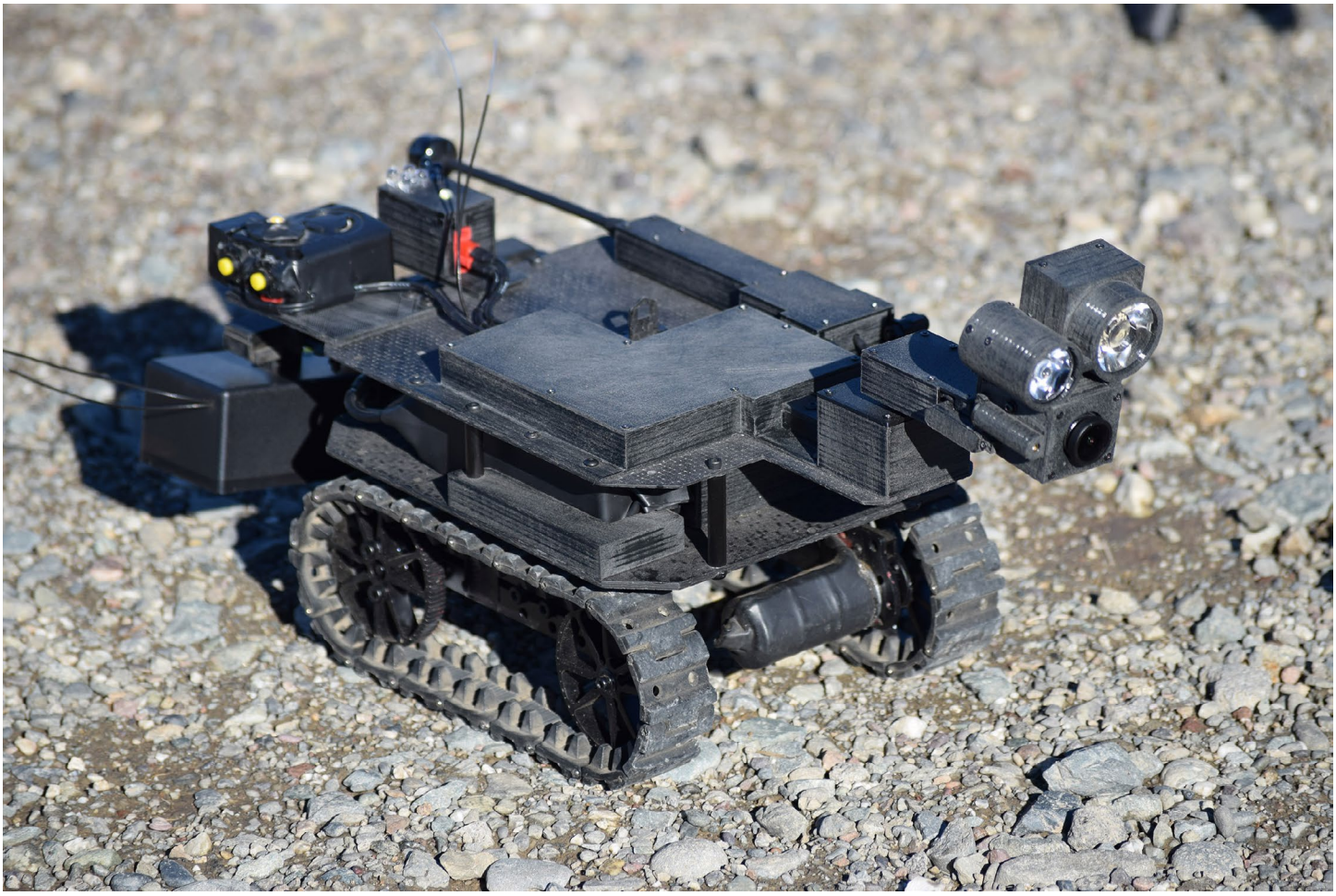
Operation Eagle Claw, the objective of which was the rescue of American embassy personnel held hostage in Tehran in April of 1980, is one of the most influential, and frequently referenced, military operations in history. Eagle Claw ended tragically with the deaths of eight American military personnel at a designated refueling / staging area identified as Desert One, located 300 miles southeast of Tehran in Iran's Dasht-e Kavir, the Great Salt Desert. The 24 April loss occurred as a result of an RH-53D *Sea Stallion* helicopter colliding with an EC-130E aircraft and resultant fire at Desert One. Over the years I've studied and written much about Operation Eagle Claw in books and magazine articles. When I first researched Operation Eagle Claw, for an article I wrote for *Weatherwise* Magazine on Grey Berets, U.S. Air Force Special Operations weather specialists (May - June, 2006 issue), I found one component of the mission fascinating beyond all others: preparation of the airfield at Desert One. Although a side note to the main Grey Berets article, and unmentioned in subsequent works I published, the airfield preparation at Desert One would catalyze the development of a number of Darack Research systems and capabilities that have now been proven by rigorous testing and evaluating, including by military practitioners.

COVERT AIRFIELD PREPARATION AT DESERT ONE:

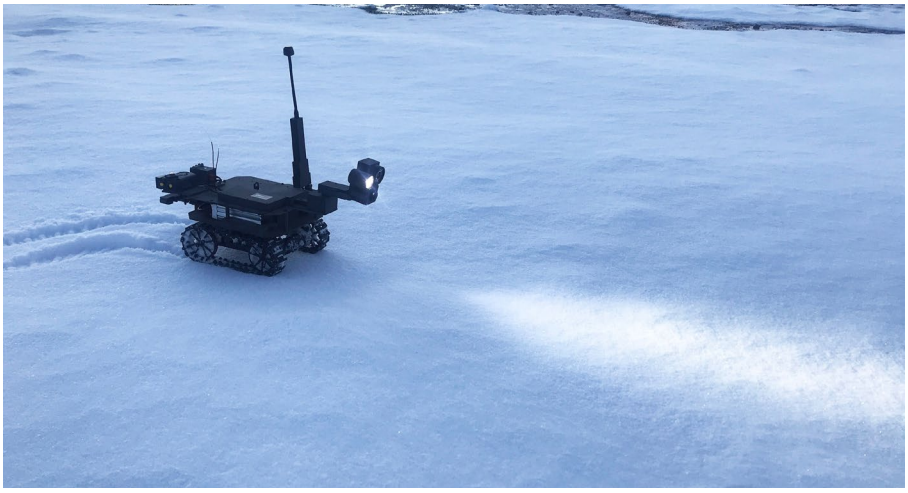
23 days prior to the force of *Sea Stallion* and C-130 aircraft converging on Desert One, a lone DHC-6 Twin Otter landed at the location in the dead of night. Onboard the small CIA-piloted craft, which flew just above the terrain to avoid radar detection, was an Air Force combat controller, Major John Carney. Upon landing, Carney assembled a folded dirt bike and then undertook surveilling the dry lake bed, taking core samples to gauge if the surface would support the aircraft. He also walked off an aircraft touch-down box, 90 feet wide by 300 feet long. He marked the corners of the box with remotely-activated infrared lights and positioned a fifth light 3,000 feet in front of the box. As the lead C-130 approached Desert One 23 days later, one of the crew flipped a switch and the runway lit. The aircraft then touched down in the box, aimed toward the fifth light. This typically overlooked, yet fascinating, portion of Operation Eagle Claw inspired me to develop Darack Research systems to accomplish the same task—and a broad host of other related tasks.

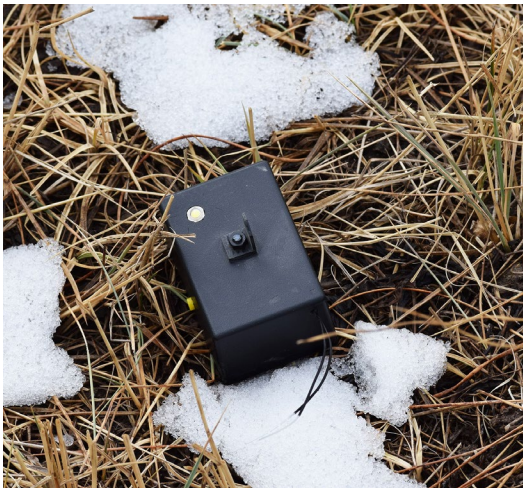
A Navy RH-53D (left) on the airfield at Desert One that was marked by remotely-activated lights installed by U.S. Air Force Combat Controller Major John Carney. A Darack Research UAV-2 in flight (right), after deploying two Darack Research remotely-activated marker beacons. Note the Darack Research Micro-Pod on upper left of UAV. This is a user-configurable pod (of a variety of colors, or infrared), so that the UAV-2, after deploying two marker beacons (or Darack Research Pods), can then form a third light point. A landing (or related) zone is then created when all three points of light are remotely activated, just like the landing zone at Desert One, with one key exception: the ground work is done remotely by Darack Research systems.

SITUATIONAL AWARENESS & SIGNATURE OPTIMIZATION WITH DARACK RESEARCH SYSTEMS:
Darack Research operational systems are designed (and now tested and proven by DoD members) to optimize situational awareness and signature at the tactical and operational levels, and to do so operated at the lowest tactical levels.
Called Small Unmanned Multi-Domain Systems ("SUMIDS"), a concept I conceived and continue to develop, these interoperable systems enable tactical and operational optimization of signature and situational awareness through both passive and active mechanisms. Darack Research operational systems can surveil a location passively, providing day / night feed with a host of information transmitted in real time, including remote system location, and then can enhance situational awareness at the tactical and operational levels with a host of active systems, including remote laser pointer, remote visible wavelength illumination, remote infrared (850nm) illumination, self marking, and marking with Darack Research marker beacons and pods. These systems can mark landing zones and targets, provide persistent ISR, and serve as platforms for subsystems.
To develop the robust spectrum of interoperable SUMIDS of the Darack Research portfolio, including air vehicles, a ground vehicle, and a variety of ground beacons and pods, I relied first and foremost on careful observation, developing a robust methodology to produce unique systems, now successfully tested and demonstrated. Part of this observation was research of history. This portion of the process illustrates how studying events of the past, in detail, may engender and synergize the development of systems that may have tremendous implications for the future.



Darack Research Ground Surveillance and Targeting Vehicle ("GSTV"), with antenna retracted (allowing it to be carried by the Darack Research UAV-1, for instance to a remote location to study a potential landing zone in detail, as Major Carney undertook with Desert One) and with two Darack Research remotely-activated Marker Beacons attached to the cargo system in rear. At front, the GSTV has a day / night passive sensor mounted to a pan / tilt head, and also has a visible wavelength illuminator, an infrared (850nm) illuminator, and a laser pointer. The modular, customizable system allows for all types of subsystems to be mounted, including the micropod seen on the rear of the GSTV, which allows for self marking. The system, as shown, weighs just four pounds, has a mission endurance of days, and can mark a simple landing zone, sparkle targets, illuminate targets, and more. Darack Research air systems have similar capabilities and can be similarly customized.



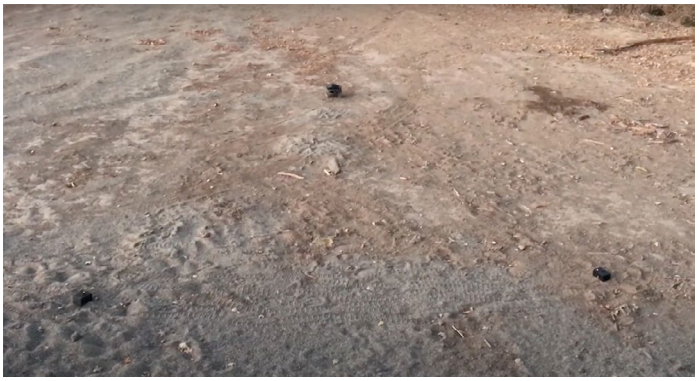


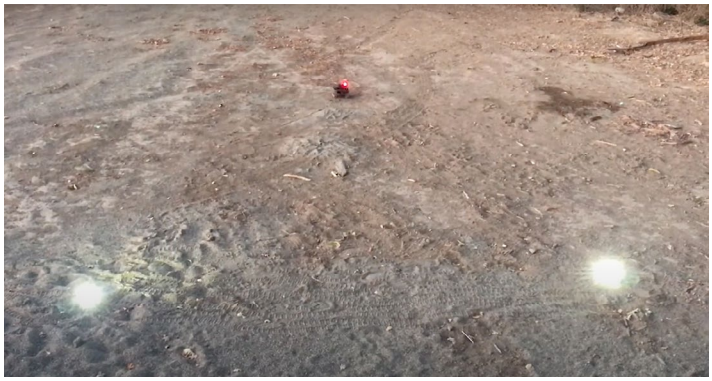
GSTV (left) demonstrating visible wavelength illuminator. Darack Research Marker Beacon (right) deployed, awaiting signal.

DARACK RESEARCH SYSTEMS IN ACTION:

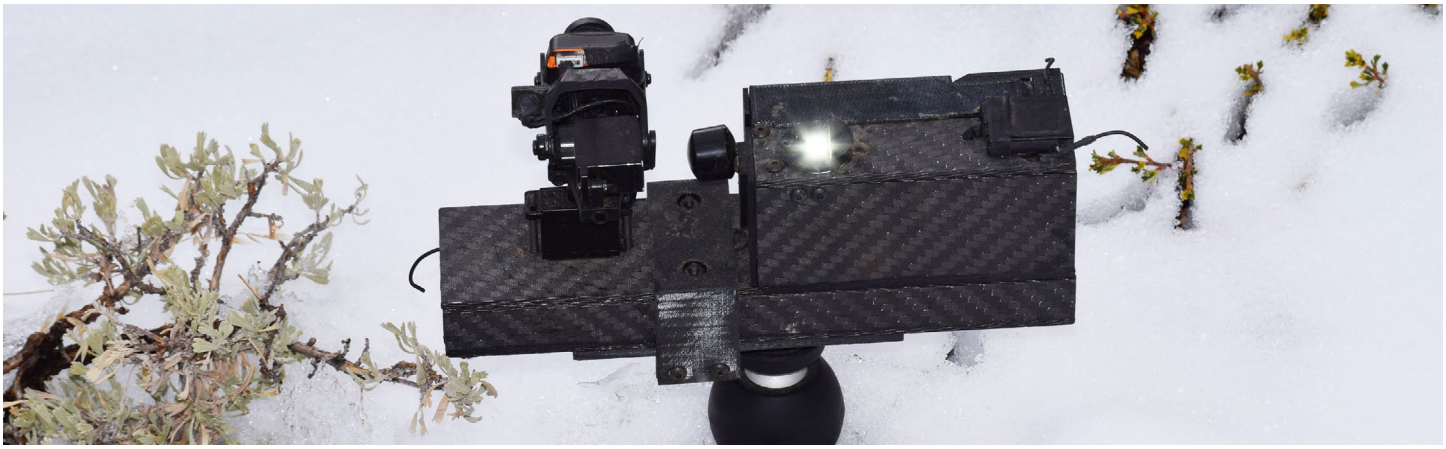
Remotely marking an airfield with Darack Research systems represents a great example of optimizing situational awareness and signature. While "painting the battlespace," in this example a landing zone just as Major Carney did at Desert One, personnel can do so from a covered position, miles distant (airfield marking tested up to more than 2.5 miles, both operation of remote vehicle and marker beacons), optimizing signature with Darack Research systems.

One of the first proof-of-concepts I undertook with my systems was marking an airfield (scaled down) with a Darack Research Ground Surveillance and Targeting Vehicle, or GSTV. Following images taken from this video.

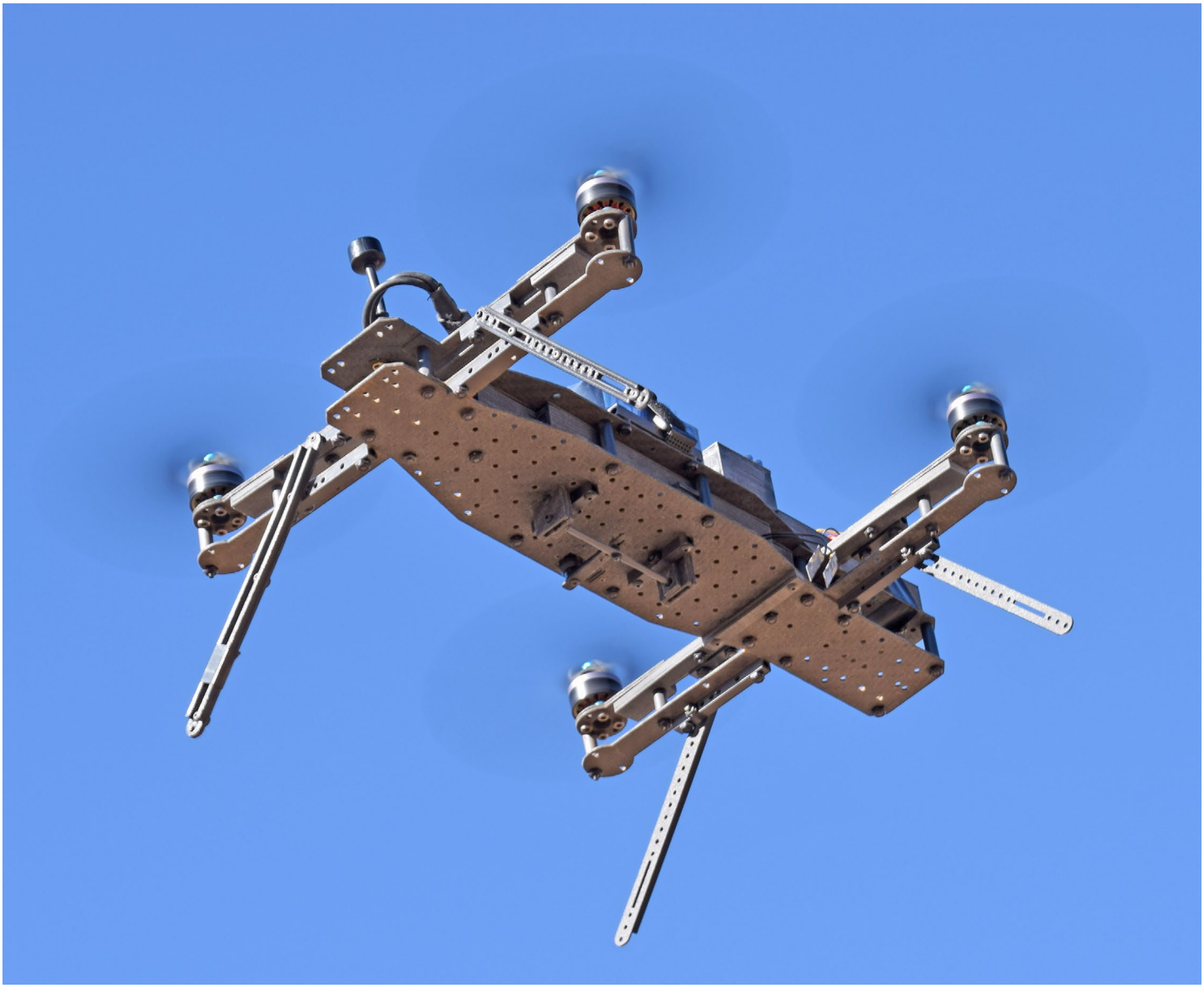


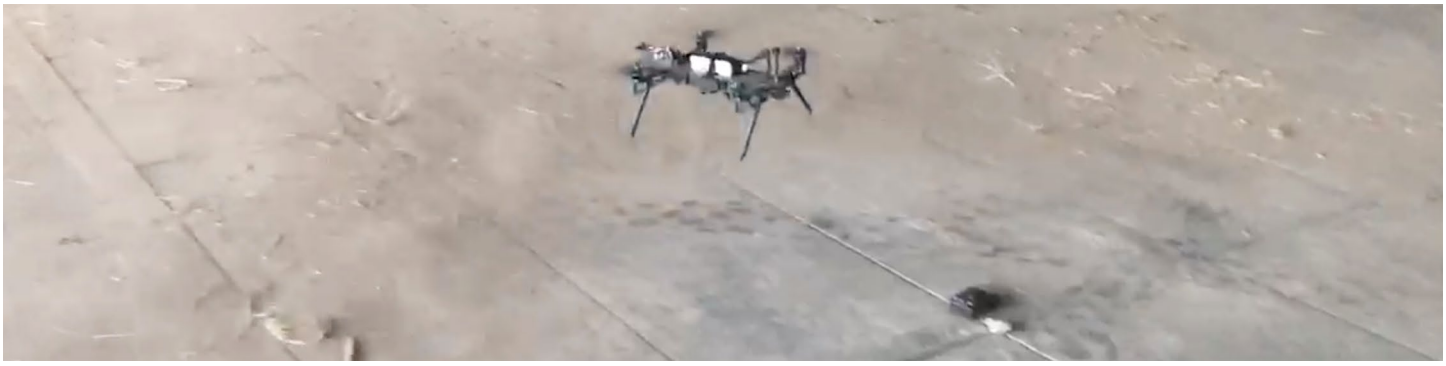


Unlit LZ (left), showing deployed Darack Research Marker Beacons (lower left and lower right), with GSTV, having just deployed the marker beacons, at top. Landing Zone lit (right).



Darack Research Static Surveillance and Targeting Pod ("SSTP"), in snow, with self-marker lit. This unit, which is a little larger than a Darack Research Marker Beacon, has a day / night sensor on a pan / tilt head with a laser mounted to the sensor for marking. The SSTP was used with two marker beacons to not only mark a landing zone, but to provide continuous ISR of the LZ. The SSTP is deployable by hand, GSTV, or Darack Research air vehicles.





Top: Darack Research UAV-2, in flight, showing underside of vehicle and two-hardpoint cargo system. The UAV-2 can deploy two Darack Research Marker Beacons, then position itself as the third point of light to create a landing zone on a single mission with a single, small SUMIDS.
The marker beacons and UAV-2 with self-marker capability, can also mark targets, sparkle targets, and illuminate targets.

Bottom: Darack Research UAV-2, lifting off after just deploying a Darack Research Marker Beacon (screen capture from video).

Darack Research UAV-1, showing its robust, and highly customizable, design, demonstrating its use as a remote weather station.

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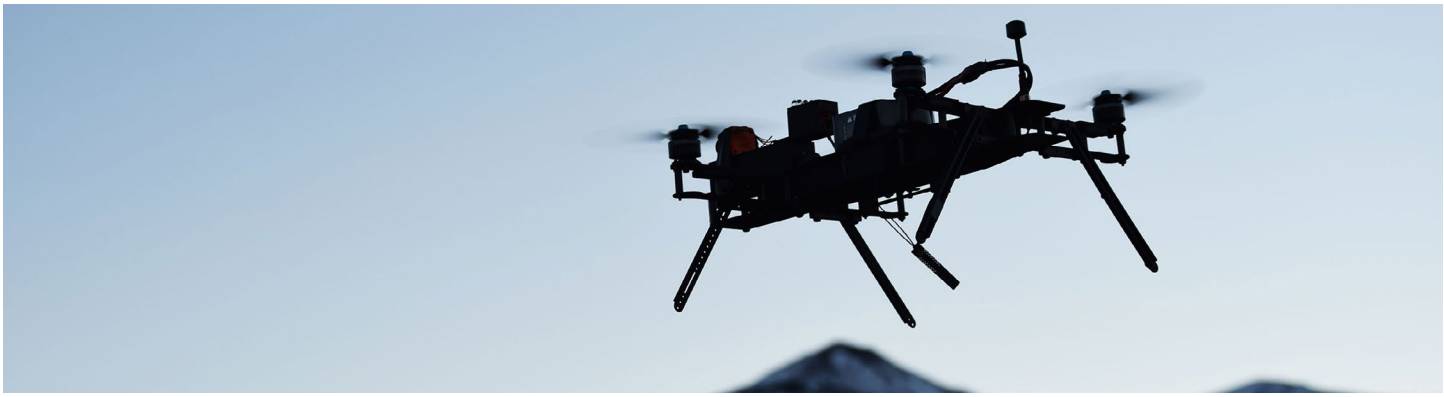

Darack Research UAV-2 during high altitude, cold weather, high and erratic wind testing outside the Marine Corps Mountain Warfare Training Center.