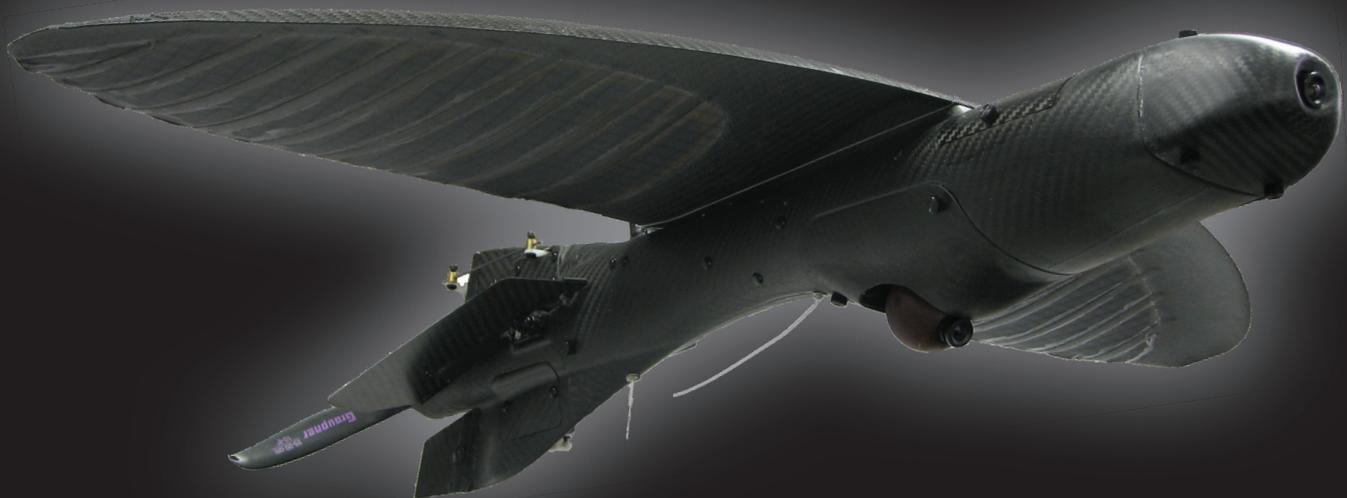




Maveric UAS

Tough. Tactical. Smart.



Prioria
Embedded Intelligence

Maveric Summary

Maveric is a true “next-generation” UAS. The Maveric air vehicle (AV) is a single-person portable and operable airplane, usable in the most rugged of conditions and equipped with the latest technologies.

The Maveric’s unique attributes owe their development to our collaborative approach with the U.S. military, industry and academia. This interaction has allowed Prioria to create the smallest UAS with a gimballed camera, which comes completely assembled and is made of advanced composite materials for durability.

Collaboration has also provided us with an exclusive license to the University of Florida’s patented bendable-wing technology. This unique technology allows the AV to store in a very small volume and deploy for launch very quickly without any assembly. It also allows the AV to fly in high winds at a variety of altitudes and to sustain most handling or landing impacts with little or no damage. No other AV has rights to this technology.

The Maveric UAS also features a sophisticated ground control system that simultaneously utilizes short- and long-range antennas to provide command and control and data backhaul at up to 15 km visual line of sight.



Maveric® Features

- Single-person portable and operable
- Rugged carbon composite airframe
- Bendable wings fold around fuselage
- No assembly required
- Immediate launch capability
- Hand launched and tube launch capable
- High performance - up to 90 minutes flight endurance and 15 km range
- Full autonomous operation for takeoff, navigation and landing
- Stealthy camouflaged bird-like profile
- Gimballed EO camera
- Advanced Toughbook GCS with TerraScope and FalconView
- Merlin real-time onboard vision processing

The high-endurance batteries enable sustained flight for up to 90 minutes, and the advance autopilot allows the user to safely hand launch within one minute.

With the combination of a highly capable team, strong financial backing, patented bending-wing technology, modular state-of-the-art payloads and high overall performance, we are certain that the Maveric UAS hits the mark for REF and can sustain REF’s requirements long into the future.

TOUGH

Maveric capitalizes on advanced composite materials and patented technology to provide a unique airframe that is rugged and durable. Maveric is also able to fly in 25 knot-sustained winds, with gusts up to 35 knots. Maveric’s rugged composition allows it to complete missions that would ground other AV’s in its size and class.

TACTICAL

Maveric deploys quickly without assembly and can be airborne in under 60 seconds. Maveric’s bendable wings allow the aircraft to be stored fully assembled in a 6-inch-diameter tube. The

storage tube and aircraft combined are small and light enough for one person to transport. Interchangeable payloads that can be swapped within two minutes also allow Maveric to fly multiple types of missions. The configurable toolkit in the GCS allows the system to instantaneously know what new payload has been installed. The system battery can be changed and the system turned around in 3 minutes.

SMART

Maveric represents state-of-the-art technology. It utilizes an optional embedded processing platform called Merlin. The Merlin platform allows images and vision-based control to be processed onboard the AV and reduces reliance on ground station communication. Merlin enables image stabilization and video recording, digital zoom and collision detection. Maveric's unique airframe design and advanced sensors, combined with the Merlin technology, gives Maveric the ability to operate effectively in complex environments.

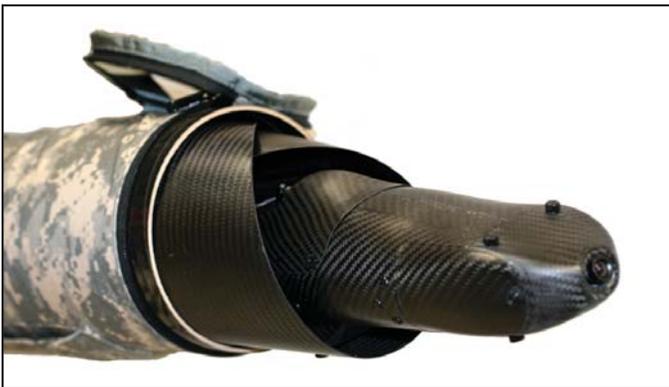
The gimbal lets you point at the target without having to fly the air vehicle in figure 8s to get imagery as with less sophisticated non-turreted systems lose effectively 50% of their flight time because they can't keep the target within the field of view - that's smart

Maveric Patented Bendable Wing

Among the many features of the Maveric UAS, the one that stands out and captures the attention and imagination of our clients, is the bendable wing. This elliptical wing, made from a single piece of carbon fiber, is unique to the Maveric. Developed using patented technology from the University of Florida, and licensed exclusively to Prioria, this wing confers five key benefits to the overall Maveric product line:



1. The entire air vehicle can be folded in a 6-inch-diameter tube fully assembled and subsequently rapidly launch.
2. The wing will deflect under high aerodynamic loads providing adaptive washout, more stable flight, ease of control and an ability to fly in 25 knot-sustained winds, with gusts up to 35 knots.
3. The wing provides a degree of biological camouflage. Black ripstop fabric and carbon fiber batons comprise the trailing surface of the wing, resembling the extended wings of a feathered bird.
4. The wing will deflect if impacted during ground handling and landing, making the entire assembly highly tolerant to damage.
5. The combination of the folding wing and advanced autopilot allow the Maveric AV to be launched directly from a tube, greatly expanding the possible applications for the system.



Rugged Design – Built for Theater Operations

In addition to the bendable wing, the Maveric AV features a folding propeller, again facilitating storage in a small tube and protecting the propeller from damage on landing. The fuselage is a single carbon composite assembly, which is extremely tough while easily repaired in the field. The entire empennage assembly bolts to the aft bulkhead of the fuselage and contains the propeller, motor, flight control surface and servos, all in one rugged carbon fiber package.

Rapid Deployment

The entire AV can be pulled from its storage tube, powered and hand launched inside one minute. The AV climbs automatically to a safe altitude and either autonomously executes its flight plan or loiters overhead, waiting for a command link. Nothing less than this is acceptable in a forward deployed position in theater, where time is critical, and operators cannot risk unnecessary exposure.

Merlin® Onboard Video Processor

Merlin is an optional embedded sensor processing system that provides onboard vision-based obstacle detection and target tracking capabilities. Prioria is continually working to evolve obstacle avoidance technology and to add other advances in onboard features including image and video recording; image stabilization; target acquisition, tracking and identification; metadata tagging of any video; frame rate throttling; chipping; and more.

High-performance Modular Payloads

Maveric contains a forward-looking camera in the nose of the AV and a rugged carbon composite interchangeable pod in its belly.



Gimbaled analog camera

Brandebury Tool BTC-40R Gimbaled EO Camera

Maveric is the smallest UAS with a gimbaled camera payload, employing the Brandebury Tool BTC-40R gimbaled EO camera. It provides 360° Az and 160° El coverage and has been in operation with the British military since 2006.



Sony optical zoom camera

Sony FCB-IX11A Optical Zoom Camera

The Sony FCB-IX11A optical zoom camera is a side-view analog device that produces real-time color imagery with a 40x zoom and field of view between 46° for wide viewing and 5° for zoom viewing.



DRS thermal infrared camera

DRS E3500S Thermal Infrared Camera

The DRS E3500S side-view infrared camera payload uses uncooled microbolometer technology that produces 320x240 resolution image at a rate of 60 frames per second. The camera has a 40° H x 30° V field of view and the AV flight management module enables digital zoom and selection of white/black hot.

Optional Nanopoint Laser Marker

Prioria also offers a payload composed of a Meyers Electro Optics model #852-UAV-NP150 Nanopoint integrated with the DRS E3500S IR camera. The 150mW laser has an effective range of 39 km, well in excess of that required for this MUAV application, and allows the operator to accurately communicate points of interest and to provide friend-or-foe confirmation.



Nanopoint laser marker

Mounted within a carbon fiber frame, each payload is as durable as the rugged airframe it connects to. The interchangeable payloads are all connected with thumb screws, and each camera payload can be swapped within two minutes in the field.

This combination of payloads, coupled with rapid reconfiguration, makes Maveric a potent, flexible and cost-effective airborne ISR asset.

Rugged, Portable Comprehensive GCS

The ground control station consists of a rugged Panasonic Toughbook® laptop, two communication boxes, high-gain Yagi antenna, tripod, cables and handheld controller. The ground control station also includes TerraScope™, Virtual Cockpit™ mission planning software and FalconView™.



Flight Trials and Evaluations

The Maveric system has a record of highly successful trials, with demanding and experienced users in difficult environments and complex tactical situations. Throughout these operations, Maveric has consistently demonstrated a very high level of performance, reliability and availability. Appendix M contains a selection of Customer testimonials, attesting to the performance of Prioria and the Maveric System.

- Summer 2008: Operational demo at Quantico, Va., for the Rapid Equipping Force (REF), U.S. Army. The REF was tasked with finding a small UAS that could supplement the Raven UAS. Funding for additional UAS was not approved although Maveric UAS performed exceptionally well during its required experiments.
- July 2008: Operational demo at Eglin Air Force Base, Pensacola, FL., for the Air Force Research Laboratory (AFRL) during Bold Quest 08. This was an invitation only event hosted by US Air Force Special Operations Command (AFSOC), AFRL and Rally Point Management. The focus was on new technology and how rapidly it could be assimilated into current systems. Maveric UAS was deemed the next generation UAS and AFSOC personnel recommended additions to the system to further advance its chances of procurement when the next cycle begins in FY 2011, and these have been completed.
- October 2008: Maveric UAS participated in the NATO Trial, Imperial Hammer, in Sardinia. Maveric was incorporated into the multi-national exercise designed to demonstrate counterterrorism technology. Over a four-day period, one multi-mission Maveric successfully completed 10 out of the 10 assigned missions. It was the only non-program of record SUAS included in the demonstration. The goal of this demonstration was to prove that one operator, one Maveric, and one field repair kit could competently support a large-scale mission.
- November 2008: Maveric UAS supported a United States Special Operations Command (USSOCOM) Mission Based Experiment at Camp Roberts, Calif. The experiment integrated multiple sensors that operate within various portions of the EM spectrum. Multiple EO/IR visible cameras were queued by both radar and unattended sensors. All sensor excitation was reported into one common operational picture (COP). This activity triggered Maveric's launch putting rapid eyes on target. Maveric then tracked and transmitted real-time video into the COP for further analysis. Maveric was able to have eyes on target over one kilometer away within 2:42 seconds of the request for support.
- November 2008: Operational demo in Roswell, New Mexico, for USSOCOM. USSOCOM and NEKASG were conducting tests on small UAS for their efforts in Iraq. The Raytheon Warfighter contract allowed for new UAS to be investigated, procured and inserted in theater. NEK was then troubled with contracting issues, which negated their ability to add additional UAS to their package for in theater insertion.
- April 2009: Maveric UAS demonstrated for United States Army Special Operations Command (USASOC) at Ft. Bragg, N.C. Maveric demonstrated the capability to handle 30-plus knot sustained winds and



Camp Roberts, Nov. 2008

complete missions tasked it. During demonstration, Maveric transmitted stabilized imagery with digital zoom capabilities all being processed on board. This demonstration was a part of the initial review of capabilities of Maveric to meet the Proximity Outdoor Miniature Robotic Aircraft System (POMRAS) requirement.

- May 2009: Maveric UAS demonstrated at Camp Roberts, CA, a continued ability to transmit stabilized video that can be input into a rapid 3D mapping program. The initial demonstration of this capability was performed at Camp Roberts in November of 2008. This demonstration was performed to prove the concept of rapid-mission planning with one SUAS with high-resolution optics.



Canadian Arctic, July 2009

- June 2009: Operational demo in Roswell, New Mexico, for USSOCOM. USSOCOM and NEKASG were developing a training curriculum for ISR. Maveric UAS was used to collect the data for these classes. IR, EO and night flights of various target scenarios were all recorded and that footage continues to be used today.
- July 2009: NASA's Flashline Mars Arctic Research Station (FMARS) program took Maveric to the Canadian Arctic to fly a series of missions over a 30 day period. 23 Million years ago, a meteor struck Devon Island creating an ultra rugged environment that was recognized as the most Mars-like topology on the planet Earth. Approximately 20 flights were conducted to explore the use of UAVs by astronauts on Mars. Maveric was noted for its survivability in the rugged environment. Maveric flew all missions
- October 2009: Lethal munitions demo at Fort Benning, GA., for the U.S. Army, U.S. Navy, NAVSOC, USASOC and USSOCOM. Along with Johns Hopkins APL, Prioria Robotics was asked to help with solutions for a lethal munitions solution from a small UAS. This demonstration used Maveric as both the ISR - Hunter - as well as the Lethal Munitions - Killer. Maveric was noted for its ability to recognize and maintain a target with its gimballed camera.

- November 2009: Camp-based experiments (CBE)/Tactical Network Topography (TNT) at Camp Atterbury, Ind., for USSOCOM. Maveric UAS flew for one week in temperatures that ranged from 15-30 degrees F (-10 to 0 degrees C). Systems were available for all flights during this testing.

- February 2010: Camp-based experiments (CBE)/Tactical Network Topography (TNT) at Avon Park Bombing Range, Avon Park, Fla., for USSOCOM. Maveric UAS was flown in convoy mode and able to demonstrate stabilized imagery ahead of moving vehicles. In addition, Prioria's TerraScope software was demonstrated. It was able to offer virtual pan tilt zoom (PTZ) and stabilized imagery while also offering target tracking from the GCS.

- March 2010: Camp-based experiments (CBE)/Tactical Network Topography (TNT) at Camp Atterbury, Ind., for USSOCOM. This iteration of TNT, the Maveric UAS was controlled by a moving vehicle. Maveric was integrated into the Tacronics control system and was flown and operated by a mobile operator. This helped to prove the viability of using Maveric in convoy protection.
- May 2010: Collaborative-based experiments at Trident Spectre 2010 in Virginia Beach, Va., for Naval Special Warfare (NSW). There were two separate goals of the Trident Spectre testing: Integrate with someone you have never worked with before and collect data that can be transmitted through the Raptor RX system. Maveric was able to accomplish both. Integration was made with ElanTech and they were able to stream all of the imagery and meta-data collected by Maveric onto the Raptor Rx network.



Camp Atterbury, Nov. 2009

- May 2010: Camp-based experiments (CBE)/Tactical Network Topography (TNT) at Camp Roberts, CA, for USSOCOM. In this testing, Maveric was tasked to do GPS estimation from a small UAS. Maveric tracked 13 different targets and used its TerraScope software to estimate their location while having a handheld GPS device in the targeted vehicle. Testing results were within 60 meters and deemed a success for a small UAS in winds that were in excess of 20kts.
- May 2010: Maveric performed an operational demo for the 720th, an AFSOC UAS specialist group, at Eglin Air Force Base, Pensacola, Fla. This demo was supported by the Air Force Research Laboratory (AFRL) and Air Force Special Operations Command (AFSOC). Next generation UAS are being evaluated by AFSOC and AFRL. Maveric is a candidate for that requirement and needed to demonstrate Cursor-on-Target (CoT) and FalconView compatibility. Both were successfully demonstrated.
- June 2010: Aberdeen Testing Center – Aberdeen, MD.
In testing for the Waterproof Transport Canister, Maveric UAS was tasked to complete two successful transitions to flight from a tube launched system created by SEA CORP. Launch success was 2 out of 2.
- July 2010: PMRF Hawaii – Maveric UAS will be tested and evaluated by NavSpecWarcom (NSW) for its WTC tube launching capability. Navy SEALs will operate canister and autonomously launch UAS.

