

SUCCESS STORY

TOPIC NUMBER: AF171-124

SBIR INVESTMENT: \$4,236,548

PHASE III FUNDING: \$5,366,365



ULTRA-ENDURANCE UAV

Leveraging SBIR funds, Platform Aerospace developed the Vanilla unmanned aerial system (UAS), a multi-sensor, multi-mission, ultra-long endurance UAS.

Platform Aerospace

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THE CHALLENGE

Unmanned aerial systems (UAS) play vital roles in modern military operations. They swiftly identify time-sensitive targets, relay enemy positions and movements to battlefield commanders and neutralize tactical objectives. Maintaining uninterrupted surveillance over a specific area is crucial in these operations. An SBIR solicitation was released to develop a cost-effective unmanned air vehicle (UAV) with an exceptional endurance of seven days, which can be used for intelligence, surveillance, and reconnaissance (ISR) missions. This challenge led to the development of the Vanilla UAS, a Group III UAS capable of multi-day flights.

THE TECHNOLOGY

The Vanilla UAS features a minimum sailplane design with a 36-foot wingspan and a modular airframe. It can accommodate various multi-intelligence sensors and communications payloads up to 150 pounds. Vanilla has an open architecture and agnostic payload, making it suitable to be used in multi-domain operations. It is designed to achieve more than eight days of continuous flight at altitudes up to 15,000 feet, with a range up to 15,000 nautical miles (NM).

THE TRANSITION

The Vanilla UAS program has won a series of SBIR contracts through Office of Naval Research (ONR), Naval Air Systems Command (NAVAIR), the Air Force Research Laboratory (AFRL), AFWERX (a technology directorate of the Air Force Research Laboratory), and the National Aeronautics and Space Administration (NASA) on topics ranging from anti-submarine warfare (ASW) to predictive maintenance modeling. In May 2022, Platform Aerospace was awarded a minimum five-year Phase III SBIR contract, N68335-22-G-0030, for the Vanilla UAS program through ONR. The Phase III award provides a sole-source contract pathway with an unlimited ceiling for Vanilla UAS procurements, operational service, and ongoing technical enhancement by any government end user.

THE NAVAL BENEFIT

Vanilla UAS significantly improves situational awareness by conducting multi-day sorties, effectively increasing ISR capabilities. This extended operational range allows for longer-range surveillance at a comparable cost, thereby increasing the distance and duration for which adversaries can be effectively monitored and engaged. Additionally, Vanilla improves safety. Because Vanilla is an ultra-endurance UAS, it allows personnel to be based at low-risk established sites. Launch and recovery operations can be performed from 1,000 miles away. The UAS' launch mechanism supports a range of truck models, allowing it to be launched from almost anywhere. Vanilla is cost effective, as fewer overall flight hours and launch/recovery events reduce wear and tear on assets, therefore lowering lifetime costs. The technology is flexible and versatile, as payloads can be rapidly swapped and include full motion video, radar, wide area motion imagery, signals intelligence (SIGINT), magnetic anomaly detection, and secure communications.

THE FUTURE

Because of the versatility of Vanilla, the UAS is being developed for different functions. Platform Aerospace was awarded a Phase II SBIR by NAVAIR to develop an ASW configuration with ongoing flight testing and system refinement. Vanilla's endurance and payload capacity enhances its ASW capacity, enabling it to expand search areas beyond the reach of current manned assets through manned-unmanned teaming (MUM-T). This allows for extended on-target persistence and optimizes the allocation of costly manned flight hours to highest priority missions. Platform Aerospace is actively working on an air-launch swarm capability for Vanilla, allowing it to deploy about 40 micro-UAS from wing-mounted stores. Each deployed micro-UAS is an individually guided disposable unit designed for remote meteorological sensing while airborne or as functioning as unattended ground systems. Moreover, this technology has the potential for broader applications and aligns with the Navy's efforts to develop advanced swarming systems.