

A Publication of the Vertical Flight Society

November/December 2025

# VERTIFLITE

Advancing Vertical Flight Since 1943



## The Robinson Legacy Lives On

AIR's Dual Market Goals

Electric Aircraft Lexicon

VerdeGo Aero: How to Hybrid

Sikorsky's Autonomous U-Hawk

Venice Hosts European Rotorcraft Forum

## Advancing Vertical Flight Since 1943

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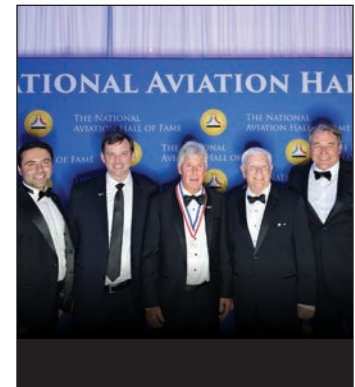
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## ABOUT OUR COVER

The 61st National Aviation Hall of Fame (NAHF) enshrinement ceremony on Sept. 19 honored Robinson Helicopter Company (RHC) founder Frank Robinson, who passed away in 2022. Attendees from left to right: Angelo Collins from VFS; David Smith, Kurt Robinson and Tim Tucker from RHC; and Chuck Street from VAI (photo: VFS staff)



# VerdeGo Aero: Harnessing Hybridization

By VFS Staff

**V**erdeGo Aero has established itself as a leader in hybrid-electric propulsion as the aviation industry seeks to leverage the benefits of electric propulsion and arrays of electric motors, while also maintaining the range, endurance and payload capacity required for many missions.

Advances in battery propulsion still offer only a fraction of the energy density of liquid fuel, which limits flight time and adds prohibitive weight. VerdeGo hybrid-electric powertrains are designed to address these limits.

Founded in 2017 and based in Daytona Beach, Florida, VerdeGo has logged hundreds of hours with its powertrains on both test stands and customer prototype aircraft. The VH-3-185, VH-4T and VH-5 powertrains span the 185-kW to 1.5-MW output range (see “Here Come the Hybrids!” Vertiflite, March/April 2025).

On Aug. 5, VerdeGo Aero announced a contract valued at \$9.7M from the US Air Force to develop its VH-4T hybrid-electric powerplant into a production version and to build and test a 415-kW prototype called the VH-4T-415.

“This project accelerates our path to a certifiable hybrid-electric propulsion system,” VerdeGo CEO Eric Bartsch said. “The VH-4T is already in demand. This award allows us to expand its capabilities and impact across the aviation industry.”

This Small Business Innovation Research (SBIR) Phase III contract, scheduled for 22 months, will build upon the Florida company’s previous work with the Air Force to develop and test the 375-kW version of its VH-4T. That previous testing of the VH-4T-RD prototype (short for research and development) was part of an Air Force AFWERX program Phase II award.



■ Hybrid Systems Integration Lab (HSIL) Flight Simulator

VerdeGo is already delivering developmental VH-4T-RD units to customers for ground and flight evaluations. These powerplants help aircraft developers accelerate testing, refine their propulsion architectures and prepare for first flights, expected to begin in 2026.

## How to Hybridize

Designing a hybrid-electric powertrain involves more than pairing an engine with a generator. It requires balancing two energy sources to harness the best of both. Range and endurance are limited in a pure battery-electric configuration. Batteries are excellent at delivering bursts of power but fall short on sustained energy. Recharging can take hours and there is often little margin for mission reserve energy. In contrast, a hybrid-electric system uses a liquid-fueled engine or turbine to generate high-voltage electricity in flight, extending mission capability and enabling rapid refueling between flights.

VerdeGo systems embody this balance. Its VH-series powerplants use either a piston or turbine engine to deliver electricity directly to high-voltage motors, which make liquid fuel, including

sustainable aviation fuel, the primary energy source. The result is five to ten times more range and endurance than a battery-only setup, enabling both longer flights and more flexible missions.

Equally important is architecture. The battery-assisted hybrid approach of VerdeGo lets the generator provide steady power for cruise while a smaller battery supports peak loads during takeoff and hovering. This configuration reduces overall weight, improves efficiency and optimizes both components for their strengths.

The VH series could add hundreds of miles of range to aircraft while freeing up payload capacity. A typical VH-4T hybrid-electric installation includes the 550-lb (250-kg) powerplant, a 250-lb (113-kg) buffer battery and 500 lb (227 kg) of fuel, in contrast with a heavier 2,000-lb (907-kg) battery pack used on some designs for electric vertical takeoff and landing (eVTOL) aircraft.

At the center of VerdeGo’s development process is its Hybrid Systems Integration Lab where full hybrid systems and aircraft subsystems are run through



simulated flight missions. Using a combination of flight simulators, control stations and hardware-in-the-loop test benches, the testing facility allows engineers and customers to test how engines, batteries and power electronics work together in real-world conditions. This test environment accelerates design cycles and minimizes integration risk. Lessons learned in the lab translate directly to the flight line.

### Mission Capabilities of the VH-4T

The VH-4T powertrain is designed to power next-generation aircraft and drone programs requiring high-voltage electric propulsion. Built around a Pratt & Whitney Canada PW207 helicopter engine, the 400 kW VH-4T converts Jet-A fuel, or sustainable aviation fuel, into high-voltage DC power for electric motors. The result is a compact, integrated power module that includes the turbine, generator, power electronics, control systems and thermal management in one complete package.

For defense applications, the VH-4T offers dramatic gains in range, endurance and payload. Military eVTOLs and uncrewed aerial systems (UAS) powered by this powertrain can fly five to ten times longer than battery-based equivalents, enabling mission flexibility for areas without charging infrastructure. As VerdeGo CEO Eric Bartsch explains, battery-only aircraft “can’t provide meaningful military utility,” but hybrid-electric aircraft can loiter for hours or cover hundreds of miles while maintaining the efficiency and precision of electric propulsion.

Hybrid-electric propulsion also has great potential for commercial aviation. Air taxis, cargo flights and regional aircraft could operate longer flight routes compared with an estimated range of 50 miles (80 km) for some battery-electric aircraft. Hybridization could also add operational flexibility by enabling multiple consecutive flights without lengthy recharging.

The VH-4T powertrain with its 400 kW of continuous output could support vehicles carrying more than 1,000 lbs (455 kg) of payload. Hybrid aircraft would still



■ Hybrid Systems Integration Lab (HSIL) Control Station



■ Hybrid Systems Integration Lab (HSIL) Testing Bay with VH-4T-RD (Photo Credit: ERAU Media / Daryl LaBello)

maintain the benefits of battery-electric flight with the control authority, noise reduction and overall flight efficiency compared with conventional aircraft powered only by directly powering the rotors or propellers from the engine.

**Why Partnering with VerdeGo Matters**  
Building a hybrid-electric powerplant can take years and cost tens of millions of dollars to refine an airworthy system to the prototype level. Leveraging VerdeGo’s powerplants including the VH-4T can take years off the development timeline for hybrid-electric aircraft while also allowing the customer to focus on the unique aspects of their aircraft, rather

than having to become hybridization experts.

Additionally, leveraging VerdeGo’s VH series powerplants enables airframers to partner with VerdeGo to benefit from its Hybrid Systems Integration Lab, proprietary analysis tools and its experienced team. These unique resources can also reduce costs and timelines significantly when hybridizing an aircraft.

VerdeGo Aero customers can integrate their own mission requirements, propulsion components and control systems into VerdeGo’s lab environment, running hardware-in-the-loop simulations to





■ VH-4T-RD 400kW (550 hp) turbine hybrid-electric powerplant

verify compatibility and optimize performance while rapidly integrating a VH series hybrid powerplant into their electric aircraft.

This approach eliminates costly guesswork and compresses timelines. By leveraging VerdeGo's proven infrastructure and powerplants, developers can reduce program costs

by accelerating their path from concept to flight test. VerdeGo's experience also reduces technical risk as its hybrid powerplants have evolved through multiple generations, from the 375 kW VH-4T-RD prototype to the refined VH-4T-415 production-intent model. The company's hybrid systems include multichannel electrical output, redundancy for safety-critical applications

and flexible voltage operation designed for certification readiness.

VerdeGo offers customers of its VH series powerplants both a world class product solution and the support services "that assist airframers with the challenges involved in figuring out how to take battery-electric aircraft and hybridize them."

The Florida company stands at the forefront of hybrid-electric propulsion, turning advanced technology into real-world capability. Its VH-4T powerplant delivers power, range and endurance while helping aircraft developers accelerate the transition to electrified flight.

Production slots are already filling, and demonstrations are available at VerdeGo's Daytona Beach Tech Center. As the company builds on the successes of its piston hybrid program which is already flying in manned test aircraft, it is preparing for first flights of the VH-4T in 2026. VerdeGo Aero's hybrid systems are set to power the next generation of vertical and distributed-electric aircraft. 

## Transformative Vertical Flight 2026

### San Jose, CA, USA

### Jan. 27–29, 2026



[vtol.org/tvf2026](https://vtol.org/tvf2026)