

# **Racine company DeltaHawk is grabbing attention for its unique diesel engine**

## **Stealth venture gets noticed**

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**Racine** - It's a stealth helicopter that looks like something out of "Star Wars," and a small group of engine designers here has played a big role in getting it off the ground.

DeltaHawk Inc., a company with only five full-time employees, has developed the world's first diesel engine for a modern helicopter. The engine is within several months of being tested in an unmanned helicopter with combat and rescue capabilities.

The fully armed helicopter drone, called a Snark, is being built in New Zealand. It has a carbon fiber body that's difficult for enemy forces to detect on radar, and its engine exhaust gases are specially cooled to evade heat-seeking missiles.

The Snark can be assembled or dismantled in only four hours. Remote-controlled from an operations base, it will have a 20-hour-plus flight range for military missions too dangerous for troops.

The first test flights of a Snark will be with a DeltaHawk engine and are scheduled for early next year, said Diane Doers, DeltaHawk president.

The satellite-controlled helicopter drone could be used for non-military purposes, such as offshore fisheries patrols, Doers said.

Flying unmanned along the New Zealand coast, for example, a Snark could splatter the sides of illegal fishing boats with fluorescent orange paint, making them an easy target for law enforcement officers to identify.

For the military, a Snark could be loaded with weapons for attacking forces on the ground, and infrared cameras for surveillance purposes.

## **Fuel sipper, not guzzler**

The Snark has been designed to land and pick up two injured soldiers on stretchers mounted to its landing gear, carrying them to safety under the guidance of an operator hundreds of miles away.

The Snark is being developed by TGR Helicorp Ltd., a New Zealand helicopter manufacturer. TGR learned about DeltaHawk through the Internet, Doers said.

TGR wanted a diesel engine partly because it can get better fuel mileage, increasing a helicopter's flight range.

"With our engine, the helicopter can go about 30 percent farther or carry more weight," Doers said. "A diesel sips fuel compared with a jet engine."

DeltaHawk's small group of engine designers operates from an old airplane hangar once used by S.C. Johnson & Son Inc. The hangar has enormous wooden ceiling beams, but mostly it's quite plain. Tools and blueprints adorn the walls.

At this point, the eight-year-old DeltaHawk is focused more on research and development than production of aircraft engines. It has built engines for small airplanes and has displayed its products at the Experimental Aircraft Association show in Oshkosh.

The company's funding has come largely from its owners and from what the company refers to as "Triple F" sources: "Friends, family and fans."

As Snark testing gets under way in early 2005, DeltaHawk also hopes to work with U.S. defense contractors to develop engines for other applications.

"We are talking to everybody and anybody in military contracting," including companies that need engines for use on the ground, Doers said.

## **Revolution over evolution**

Boeing Phantom Works, a division of Boeing Co., is building several versions of helicopter drones and plans to start test-flying them early next year. The aerospace company has shown interest in diesels and is sending a delegation to visit DeltaHawk next month.

With a little luck, the Racine company could work with Boeing under the auspices of the federal government's Defense Advanced Research Projects Agency, known as DARPA.

DARPA emphasizes long-range research that has high technical risks, said Jan Walker, agency spokeswoman.

"We look at technologies that would provide revolutionary, rather than evolutionary, capabilities," Walker said. "We tend to focus on breakthrough changes."

Oshkosh Truck Corp., based in Oshkosh, has worked with DARPA to develop robotic, all-terrain trucks. In 2005, the company will compete in a DARPA race where unmanned trucks will speed across 175 miles of desert with natural and man-made obstacles. The winner of the race will receive \$2 million.

Mostly, Wisconsin companies haven't done well with DARPA or other military contracts. The state ranks 49th per capita in bringing home Pentagon dollars, ahead of Nevada.

Small companies such as DeltaHawk find it easier to get Department of Defense business under the wing of big contractors such as Boeing, said Michael Klonsinski, executive director of Wisconsin Manufacturing Extension Partnership, a non-profit organization that helps companies with productivity issues.

"Unfortunately, a lot of this gets political, especially with the large defense contracts," Klonsinski said.

Diesels might be poised for a comeback for military purposes as the U.S. military lessens its dependence on aviation gasoline, which is highly explosive and poses security threats on ships and in storage facilities.



Photo/[Benny Sieu](#)

Dean Bergman (left), production engineer, and Doug Doers, DeltaHawk vice president, work on a diesel aircraft engine used in experimental aircraft, like the Velocity RG in the background, at DeltaHawk Inc. The engines will be tested soon in an unmanned helicopter called the Snark.

### Flying Diesel

- How it works: Diesel engine exhaust from the Snark helicopter will be mixed with cold air, making it hard for heat-seeking missiles to detect.
- Who built it: The engine was developed by DeltaHawk in Racine. DeltaHawk was started in 1996 after one of its founders, an airline pilot, searched in vain for an engine to make a record endurance flight.
- Next: The engine will be flight-tested early next year.

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