



## A drone maker flies high

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Rob Gustavsson, a field-test engineer for Aeryon Labs, grabs a suitcase-sized plastic case and wheels it into the company's parking lot in suburban Waterloo, Ontario.

Inside are the components of an un-manned aerial vehicle (UAV): rotors, a four-legged body and a high-definition camera inside a plastic sphere. He snaps the \$65,000 (U.S.) device together, pops in a lithium battery and powers it up via a touch-screen tablet.

The UAV ascends and hovers, motionless, about 10 storeys up. Gustavsson points to a video feed on one corner of the tablet. "You can see us standing here," he says, pointing to two dots on the lot. Gustavsson then taps out a few commands and suddenly the video zooms in on two hard-hats on a construction site half a kilometre away. "You can see what they're doing," he says.

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It's both creepy and cool. Okay, mostly cool.

Since its first sale in 2009, Aeryon has carved out an impressive presence in the global UAV market, which rapidly has roared beyond the confines of the military-industrial complex. The privately held 80-employee firm produces two models: the original Scout and the Skyranger, launched in 2013, which can stay aloft for 50 minutes. Assembled from parts made by suppliers, Aeryon's drones can fly 50 kilometres an hour. They can be equipped with either daylight or infrared digital cameras that have up to 60x zoom lenses.

Co-founder and CEO Dave Kroetsch says the company is profitable, with revenues doubling on a year-over-year basis. Commercial and public-safety applications are expected to drive worldwide UAV revenues over the \$1-billion (U.S.)-a-year mark in less than a decade, says Philip Finnegan of the Teal Group, a Virginia market research firm. There are hundreds of firms in the market, including aerospace giants like Boeing.

Aeryon, analysts say, is well-positioned to take advantage of new commercial markets because its drones are reliable in harsh weather and easy to use. Kroetsch recalls that early on, he found himself pitching to members of an Ontario police force. "They said, 'We love your concept but we're not that bright, we have fat fingers and we break things.' That became a design mantra."

Aeryon eschews the exploding hobbyist market; many of its customers are surveyors or industrial users, who use the drones to conduct tower, stack or pipeline inspections. And then there's the agricultural market. "Farmers are really interested in getting data about their crops on a regular basis," says Angela Schoellig, a professor with the University of Toronto's Institute of Aerospace Studies. "That's a big market for the industry."

John Ziemanski, who runs a Nanaimo, B.C., surveying firm, bought an Aeryon UAV to do digital mapping for mining and forestry clients. Having UAVs fly over a site, taking hundreds of images, can cut the time required by 90% compared to dispatching surveyors with cameras to spend days trudging around forestry cuts. Then there's the media industry. Aeryon this spring partnered with another Waterloo firm, Dejero, which has a technology that transmits broadcast-quality video wirelessly. Founder Bogdan Frusina, who says there are synergies between the two firm's technologies, has his eye on broadcast uses for news and sports. Due to strict regulations, he adds, "It's not there yet."

The Aeryon story starts in a high-school science class where Kroetsch saw a video about remote-control planes. He founded a robotics club and kept dabbling in remote-control models as he studied engineering at the University of Waterloo.

After several tech jobs, Kroetsch and two friends, Mike Peasgood and Steffen Lindner, decided to design and build a remote-control plane equipped with a camera. The electronics were housed in an old Pringles can.

The trio talked to land surveyors and police to understand how such a device might be used. It was 2006, and news reports from Iraq and Afghanistan cited American use of high-altitude "drone" bombers. Aeryon opted to avoid the military market and focus on civilian uses.

But military orders came in nonetheless. Early customers included Libyan rebels and the Saudi defence ministry. Says Kroetsch, "We were a little bit out of our comfort zone." Today, the customer base is roughly half military, with the other half evenly divided between public-safety and commercial applications.

As the order book grew, the company refined its technology. Aeryon's engineers included features such as an automatic override that lands the UAV if the digital navigation system conks out. Schoellig says that Aeryon, unlike American rivals, has been able to continuously test its UAVs because Transport Canada has far looser rules than the FAA.

Law enforcement agencies like the Ontario Provincial Police deploy Aeryon's drones at highway accident scenes, capturing images for investigations. Here, too, speed counts: Police can reopen highways faster when they don't have to take the photos themselves.

As UAV orders grow, Kroetsch knows his industry's fate lies with American aviation regulators. The FAA is reviewing its rules, which restrict commercial users from operating UAVs near buildings, people and airports, and require operators to keep the devices within their line of sight.

Aeryon recently secured FAA exemptions for American customers, such as power authorities. Kroetsch knows the regulatory environment could turn abruptly due to high-profile incidents such as

the “quad-copter” that landed on the White House lawn in January. But that won’t stop Aeryon, he says: “It’s a speed bump.”

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