

## Unmanned Aerial Vehicles -- drones -- up in the air

Drones, viewed with both fascination and fear, likely to become common

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Published 10:40 pm, Monday, April 14, 2014

At The Hobby Center in Danbury, Karl LaLonde, the store's owner, holds the Proto-X in the palm of his hand.

It's about as wide as a silver dollar. LaLonde has decorated it with an orange piece of plastic, shaped like a bird's beak.

Switched on, its four tiny propellers spin. Under LaLonde's control via a joystick, it lifts off the counter and goes scooting around the store's airspace.

The Proto-X costs \$50.

"You can get a camera to fit it," LaLonde said.

It's the smallest of the many UAVs -- unmanned aerial vehicles -- LaLonde sells. Business is good. He's selling a lot, in different sizes and shapes.

Except for one thing.

"Don't call them drones," he said. "People hate that name."

But whether UAVs or drones, they're ready to zoom into our daily lives, flying around, sometimes watching or taking pictures.

Or to be used for darker purposes. Last week, a Moroccan national was charged with planning an attack on a federal office in Bridgeport using an explosive-laden radio-controlled model airplane.

As drones, some so small and silent they can go unnoticed, may be used for surveillance or even to record conversations, concerns about privacy follow.

And, although drones are becoming increasingly common, they're largely unregulated in Connecticut.

The UAV cats may be scooting out of the bag. They're on the scene, much more than the uninitiated might realize.

UAVs are readily available; Amazon sells them, so do hobby shops like LaLound's. Enthusiasts take them through their paces in places like the Danbury Police Athletic League gym.

"I've been doing this for years," said Joe Giacone, 66, of Ridgefield, who was at the PAL gym with his radio-controlled airplane last week. "I got started when I was in high school."

When Giacone started, his planes were gas powered.

"Now, everything's electric -- no noise, no smell, no muss," he said.

And, he said, the UAVs of today are less expensive and easier to control than the ones of the past.

"You can do more with them," he said.

Others are thinking along the same line. The Federal Aviation Administration estimates there could be 30,000 drones in the airspace by the end of the decade.

They're being used increasingly for many different purposes. Realtors are using drones to shoot videos of homes they're trying to sell. Filmmakers -- documentary or features -- use them. So do farmers.

"They've been used in Japan for spraying crops for the last 20 years," said Missy Cummings, an associate professor of mechanical engineering and materials science at Duke University, who also heads the Humans and Automation Laboratory at the Massachusetts Institute of Technology.

And -- which is why some people don't like the name "drone" -- they can be used to kill people.

Darker purposes

The United States has used drones to attack the leaders of al-Qaida for the past decade, garnering international criticism along the way.

Human bloodshed was also the alleged intent of El Mehdi Semaili Fathi, who was arrested in Bridgeport Tuesday. The FBI claims Fathi planned to use a remote controlled plane, laden with explosives, to attack a federal building in Bridgeport and an undisclosed university in another state. For nearly two months, Fathi boasted to an undercover federal agent about his plans, law enforcement officials said.

The scheme may sound farfetched to those unaware of the availability of drones today. But for those who know about the technology, it doesn't.

"No," said Joseph Acosta, owner of Build Right Fly Right in Wallingford, who has served as a consultant to United Technologies and Yale University, when asked if he was surprised by Fathi's alleged plans.

Is it possible?

"Yes," according to Michael Balboni, who served as the senior homeland security and law enforcement official in former New York Gov. David Patterson's administration.

"There are platforms available that can handle payloads of 10 to 15 pounds," Balboni said. "But there

are challenges."

Still, Acosta and Balboni said, there are devices available that could allow someone with the proper training to put it in the air, control it and detonate it from a distance.

And unfortunately, Balboni said, "there are folks out there always looking for new opportunities."

In this case, the modus operandi would change from a vehicle loaded with explosives that carries a license plate, can be captured on street cameras and could generate a warning from suspicious passers-by.

Those are all reasons why Faisal Shahzad, the last Bridgeport bomber, failed in his attempt in 2010 to blowup Times Square and is now spending life in federal prison.

But nowadays China has perfected technology that allows it to add Autonomous Quad Rotor Flight and First Person View Flight -- which enables a person to control the vehicle by images sent from its camera to the operator's monitor or goggles.

Air vehicles also can be equipped with a stationary hold that allows it to stay in a spot and hover as well as GPS capability -- input coordinates and you can dispatch the device to a destination within a 7-foot range. A stationary building would be no problem to hit.

But the key to all of this is the type of training the on-ground pilot received.

"Recreational model airplane pilots take approximately 40 hours outside prior to being proficient," Acosta said. "But you can buy a computer simulation program, spend two-to-three hours a day practicing on your computer and learn in a week."

He said most recreational pilots can fly accurately within 400 feet. A recreational model airplane can fly up to 1,000 feet in linear distance and not higher than 400 feet.

"You just can't walk into a store, buy an air vehicle and walk out expecting to have immediate success," Acosta said, adding that it takes a lot of practice.

And while he said people have threatened to fly these devices into buildings, Acosta is unaware of anyone who has been successful.

Additionally, he said, an urban setting with high rises, corners and wired poles present issues, including signal reception.

Is the sky a public place?

At the moment in Connecticut, there's really no control over who does what with drones or UVAs.

There are Federal Aeronautics Administration regulations governing their use near airports, said Kevin Dillon, executive director of the Connecticut Airport Authority.

Dillon said the FAA is also expected to issue broader rules on the use of drones in 2015.

"That's what everyone is waiting for," he said.

State Rep. James Albis, D-East Haven, proposed legislation that would regulate drone use by law enforcement agencies, requiring them to get a warrant to use drones for surveillance.

Albis said the legislation has died this year. But there's a working group in the legislature's Judiciary Committee that's hoping to write more comprehensive legislation for 2015, he said.

"There are many meritorious uses for drones, but there are opportunities for abuse," Albis said. "We want to see their responsible use."

The American Civil Liberties Union in Connecticut supported Albis' legislation.

ACLU staff attorney David McGuire said in testimony before the General Assembly that regulations are needed, given the ability of small, camera-bearing drones to fly in from above and hover next to someone's house.

"Drones can get very close to the ground, to buildings and to people without being detected," McGuire said in his testimony. "They can take high-resolution in your yard, and record your conversations."

And, they can also be equipped with tear gas or Tasers, McGuire said.

Albis' legislation dealt only with law enforcement use of drones.

The FAA had asserted its right to control commercial use of drones, banning it in 2007. For that reason, it launched an investigation in February of the use of a drone by a television cameraman to shoot footage of a fatal car accident in Hartford.

But in March, an administrative judge with the National Transportation Safety Board ruled the FAA did not have any right to institute the ban because the agency had not followed the proper rule-making procedures in creating it.

The FAA is appealing this decision.

Peter Sachs of Branford -- a public advocacy attorney, pilot, drone enthusiast and founder of the website [dronelawjournal.com](http://dronelawjournal.com) -- called the decision a "scathing" rebuke of the FAA.

"They never had the right to regulate drones," Sachs said.

While a member of the ACLU, Sachs finds himself opposed to the regulatory approach the group is supporting with Albis' legislation.

"The sky is a public place," he said, just as a sidewalk or roadway is.

## Seeing benefits

Albis and the ACLU are right in this regard: Police and fire departments are eyeing drone technology.

Danbury Police Chief Al Baker said he started seeing companies marketing drones at police trade shows around 2011.

"They used to be really expensive," Baker said. "But now the price has really come down."

Both Baker and Danbury Fire Chief Geoff Herald said they could foresee many uses for drones in a public safety setting -- searching for missing persons, or getting an aerial view of a fire or a large crime scene.

"It won't happen this year or next year, but it's definitely going to happen," Baker said.

"It would be much less expensive than getting me a helicopter," Herald said.

Thanks to Sachs, drones have been used by firefighters. In January, when a fire broke out in a quarry in Branford near a shed storing explosives, Sachs -- a member of the Branford Volunteer Fire Department -- used one of his drones to fly over the fire to get a better idea of what the blaze was doing.

"It was the first time a drone was used at a fire in Connecticut to give the department information," Sachs said.

Craig Woolsey, a professor of aerospace and oceanic engineering at Virginia Tech involved in drone research, said he works near the Appalachian Trail. People regularly wander off the trail and get lost every summer.

"It would make a whole lot more sense to send a drone to look for them, rather than hundreds of people," he said.

Drones in agriculture would allow farmers to send a UAV out in the field, scout the field with a camera for plant disease, then apply herbicides or fungicides selectively rather than treating an entire field, Woolsey said.

"They may even be used in vineyards to scare away birds," he said. "In France, they're using them to map strip mines."

Sachs acknowledged drone operators may need to have some certification, with some aeronautical knowledge as well as liability insurance.

But he said banning them just because terrorists can use them, makes as much sense as taking pressure cookers off the shelves of every store in the United States because the terrorists who attacked at the Boston Marathon used pressure cookers to make their bombs.

"People fear what they don't understand," he said.

Cummings of MIT also said what surprises her is that people are so concerned about privacy issues with drones, while ignoring those same risks when they use cell phones or go on Facebook.

"The government can find out much more about you through your cell phone," she said. "Rather than banning drones, we should be looking at the entire range of electronic surveillance. Drones are such a tiny part of that."

But, Cummings said, she has an entirely unscientific observation proving people are getting more educated about drones and the possibilities they offer.

"I was on the Stephen Colbert show two years ago, speaking in favor of drones," she said. "I got a lot of hate mail. One called me evil."

"A year later I was on the Jon Stewart show," she said. "I got some hate mail, but no one called me evil."

"Then, I was on '60 Minutes' a few weeks ago," Cummings said. "I only got one piece of hate mail. It's becoming clear there are a lot of good applications for these things."

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