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Drones Are Techies' New Darlings

By JESSICA E VASCELLARO



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Amateur drone makers are sending their do-it-yourself creations up into the skies of Silicon Valley. WSJ's Andy Jordan reports from San Francisco on the stunning footage they're capturing.

Silicon Valley is taking its penchant for programming to the skies.

Thanks to a proliferation of inexpensive sensors, chips, cameras and other gizmos that can be tacked onto wannabe spy planes and helicopters, it's easier than ever for technologists to build craft that fly themselves.

The techies are sending the three-to-six foot wide drones, guided by computers, radios and soon cellphones, to survey fields, capture action shots from the air or follow them around to snap photos at optimal angles. About their only constraints: a 400-foot ceiling for amateur drones set by the Federal Aviation Administration—and battery life.

Jason Short, a product designer for design firm Smart Design in San Francisco, has built about a dozen drones for \$150 to \$1,000 each. He says he spends at least 20 hours a week tweaking and flying them. Mr. Short, 40 years old says drones have allowed him to capture some hard-to-get photos of the Bay Area—including an image of himself on top of Corona Heights shot from far away.



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Mr. Short, who helped design the Flip video camera, is working on technology that allows the drones to be controlled via iPhones and Android devices. He also recently built drones with a fancy chip that can process inputs from three gyroscopes, three accelerometers and a compass. "We're ahead of the phones," says Mr. Short, who adds that he prefers

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Associated Press
Mark Harrison, left, pilots a drone as Andreas Oesterer watches in Berkeley.

the helicopters to the airplanes, because they are easier to test in his backyard.

At Berkeley Marina, 49-year-old Mark Harrison, a software engineer at Walt Disney Co.'s Pixar Animation, takes his airplane drone and "quadcopter" out for a spin almost every weekend. His fanciest drone is equipped with a camera that allows him to see what it sees by wearing goggles. "It's very similar to being in the air," he says.

The drone subculture in Silicon Valley reflects the widening use of unpiloted aircraft by the U.S. military and law-enforcement agencies. Some entrepreneurs are imagining businesses based on the gadgets, such as the TacoCopter, a brainstorm of some computer programmers, which would deliver a taco to a customer's door.

The growth and increased sophistication of the toy vehicles has raised questions about whether the technology should be in hobbyists' hands. Privacy advocates, meantime, have raised concerns that drones could be used for surveillance.

The FAA allows amateurs to fly drones for fun, as long as they stick to rules like not flying the machines over people and keeping their drones below 400 feet and in their line of sight. The FAA has said it plans to allow commercial use—meaning businesses that deploy drones, such as the TacoCopter concept—in the coming years.

Meanwhile, demand is increasing for instruction on how to build a drone. Ace Monster Toys, a workshop for hackers in Oakland, plans to hold sessions for building 10 to 20 drones in coming months. Al Billings, Ace Monster's president, who works on security communications for the Mozilla Foundation, says building a drone can be detailed, requiring soldering, other mechanical skills and uploading software to run the hardware.

"If things go crazy, it will fly in your face," Mr. Billings says of the devices. One of the trickiest steps is calibrating a drone to fly outdoors based on the wind and other variables, he adds.

Some are proving drone-building can be a business. In 2009, Chris Anderson, editor-in-chief of Wired and a drone evangelist, co-founded 3D Robotics Inc. in San Diego. The firm sells drone parts, such as electronic pilots and sensors. He says it is growing at 50% a year and has multimillions in revenue.

Mr. Anderson likens the community of hobbyists to Silicon Valley's Homebrew Computer Club in the 1970s, where Apple Inc. co-founders Steve Jobs and Steve Wozniak showed off their first personal computer. At the time, the future uses of computers weren't clear, says Mr. Anderson, with the software applications materializing over time. "I think drones will go the same way," he says.

Write to Jessica E. Vascellaro at jessica.vascellaro@wsj.com

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About Jessica Vascellaro

Jessica Vascellaro is a senior technology reporter for The Wall Street Journal, based in San Francisco. Since joining the paper in 2005, Jessica has covered numerous technology and media companies, from corporate giants like Google Inc. and Apple Inc. to scrappy startups. Her passion is getting behind the scenes of the Bay Area companies changing the way we live. Jessica has also served as deputy bureau chief of the Wall Street Journal's media bureau and is a regular contributor to The Journal's online video programs. She graduated from Harvard University in 2005.

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