Opinion: Law and Order in the skies

"Microdrones" are consumer products — and should be regulated that way

By Henry H. Perritt, Jr. and Eliot O. Sprague
June 13, 2014

On Tuesday, the Federal Aviation Administration (FAA) announced that it has approved oil company BP to perform drone flights to survey roads, pipelines, and other equipment in Prudhoe Bay, Alaska. This is the first commercial drone authorization and is a step forward in the effort to spread the commercial use of unmanned aircraft. It does not, however, represent a viable approach to regulating these aircraft. Alaska's remoteness is unrepresentative of the lower 48. Moreover, the drones approved for Alaska are adaptations of military fixed-wing models, and the approval is layered with restrictions pertinent to specifics of the vehicles and the territory.

The interesting technological revolution that is buzzing around the heads of regulators involves a different kind of drone — one with multiple helicopter-like rotors. These rotors combine the advantages of helicopter flight profiles with electric propulsion systems whose variable RPM eliminates the mechanical complexity associated with varying the pitch of spinning rotor blades.

Police officers, reporters, real estate agents, and farmers are rushing to buy thousand-dollar versions of microdrones, defying the FAA position that flying them is illegal. Calling them sUAVs (small Unmanned Aerial Vehicles) instead of "drones" is fruitless political correctness; the word "drone" will stick.

Anyone can buy one on Amazon and have it delivered the next day, ready to capture high-definition video and stream it back to the Drone Operator (DROP). Their utility in capturing news, supporting law enforcement, selling real estate, and patrolling pipelines and power lines for defects is obvious, and you don't have to have a pilot's license to fly them safely — even though the FAA says you do to fly them *legally*.

Congress is several steps ahead of the FAA. It said that the FAA was supposed to begin integrating drones into the national airspace system by 2013. It's now mid-2014, and the best the FAA can do is to reiterate its position that drone flight for commercial purposes is illegal.

Meanwhile, it vaguely promises an initial notice of proposed rulemaking sometime before the end of 2014, grudgingly granting a few special approvals for isolated geographic areas like Alaska, and expressing willingness to consider equally specific requests from Hollywood. Most people buying and using these vehicles don't care about the FAA's prohibition — indeed many of them are probably unsure of exactly what the FAA is.

This is only the latest example of regulatory decision-makers being straitjacketed by their pasts while technology makes the details of their regulations irrelevant. Young engineers — good young engineers — will know how to confront such regulatory challenges. They will understand that policy can be just as important as finding a technical solution. Their creativity will inform policymakers about how technology can supplement law.

Some form of regulation of drones is necessary. A 787 flight crew responsible for 300 passengers doesn't want to encounter a microdrone on final approach. A police or news helicopter pilot doesn't want to compete with small aviation outlaws for access to the skies over a fire or an active shooter scene. It would hurt like hell if a 12-pound bowling ball hit you on the head. Some microdrones weigh more than that.

The implications for personal privacy are important, but privacy is essentially a sideshow. Legal doctrines for protecting personal data are already crystallized, and privacy advocacy organizations are sophisticated in making their views heard and attended to in political and regulatory arenas. The main issues relate to safety, and the FAA needs to do its job in a realistic way.

Taking another five years to go through every line of the 500 pages of existing federal aviation regulations to mold the details of existing requirements for manned aircraft is not the right approach. Manned airplanes and helicopters cost anywhere from hundreds of thousands to tens of millions of dollars. Rules for their flight are implemented through professional pilots, mechanics, and directors of operations who have designed their careers around manned aircraft.

Instead, the FAA must recognize microdrones for what they are: inexpensive consumer products that put strikingly useful technologies within the reach of almost everyone.

The U.S. legal system knows how to regulate consumer products. Lawn mowers can't be sold unless they comply with basic Consumer Product Safety Commission requirements for guards and deadman controls. Smartphones and Wi-Fi points of presence are excluded from the market unless they meet FCC requirements that avoid interference with other spectrum users.

There's no need to license DROPs like aircraft pilots. Nor is there a need for hundreds of pages of detailed regulations prescribing flight altitudes, routes of flight, and human radio communication with air-traffic controllers. Whatever limitations are appropriate to ensure safety can be built into the microdrones themselves. They can be law-abiding when they come out of the box. Technology won't let them be flown in violation of the law.

Microdrones already know how to do this. They can take off, hover, fly a GPS-defined grid, and return to their launching point autonomously. They can be programmed not to exceed particular heights above the ground and to stay within a certain radius of their DROPs.

Such autonomy, under a sensible regulatory approach, can be embedded in firmware and made extremely difficult for anyone to override. This is the only approach that will permit this new technological revolution to be channeled in a useful and safe direction. We all need it soon.

Technology creates risks, but it also provides a means to enforce the rules that reduce the risk.

Henry H. Perritt, Jr. '66 and Eliot O. Sprague manage Modovolate Aviation LCC, which conducts drone research, evaluation, demonstration, and education programs.

Post a comment on this article