

WORLD AIR NEWS

for continental Africa

Volume 42, No. 1

AFRICA'S LEADING AVIATION JOURNAL

March 2014



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DRONES FLY INTO THE MAINSTREAM

By Henry M. Holden

DRONES' POTENTIAL applications include law enforcement, agriculture, real estate sales, oil and gas exploration, maritime security, hurricane hunting, 3-D mapping, wildlife management, search and rescue, video golf marketing, and more.

According to the Association for Unmanned Vehicle Systems International (UAVSI), by 2025, the drone industry will employ 100 000 people, and be worth US\$82-billion globally.

Japan now has more than 90% of its crop dusting done by drones. "For more than 20 years, the Yamaha RMAX has used remotely piloted helicopters for precision crop dusting, weed and pest control," said Henio Arcangeli, a vice-president at Yamaha. "More than 2 600 RMAXs are in operation today, treating over 2,4-million acres of farmland in Japan alone."

According to Ben Gielow, a spokesperson for UAVSI: "Agriculture far and away is going to be the dominant market for UAV operations. In Japan, a lot of farmland is on steep hillsides, and those UAVs can treat an acre in five minutes. That's very difficult or even impossible to do with a tractor."

Research by an industry trade association indicates use of RMAX and similar drones could improve crop yields by 15%, increase net returns by \$17 to \$54 per acre, and reduce fertilizer use by as much as 40 percent.

During the past 20 years, RMAX drones have flown more than two-million flight hours. Yamaha has exacting safety standards, including flight stability systems and GPS for speed and hovering control, a loss link feature that guides the unit to hover in place and then slowly land if there is any loss of radio communication. It also is fitted with a rotor brake that brings the propeller to a full stop within seconds of a landing.

The precision agriculture movement uses technology to monitor fields, increasing yields and saving money. Gielow noted that precision applications of pesticides, water, or fertilizers, which drones could help by identifying exactly where such resources were needed and delivering them there, was better for the environment and for a farmer's bottom line.

Professor Mary Cummings, of Duke University, provided an example in the United Kingdom, where drones may be used for photography, monitoring crops, and delivering



(The Patriot News)

Above: A 1981 FAA advisory regulating model aircraft is the basis for albeit illegal standards for small drone flights in the real estate business. **Below:** Law enforcement agencies are increasingly making use of drones for a wide variety of tasks.



(www.thesmokingtire.com)

food from restaurants to homes.

Last August, the South African Oppikoppi music festival, in the Limpopo province, saw fans using their smart phones to have their beer delivered by drones, right to their seats. Companies in Australia and China have used drones for package delivery.

In real estate sales, one realtor said: "It occurred to me that a video camera on a drone would be an unusual way to show the homes for sale. It might attract more attention to them, which is exactly what you want. Plus it would give buyers a different perspective on each home and its surroundings, something they couldn't easily get otherwise."

The United States, however, lags far behind other nations in the use of UAVs, for commercial purposes.

Amazon CEO, Jeff Bezos, appeared on CBS television in early December, surprising viewers of 60 Minutes by saying his company was testing drones that could deliver packages in as little as half an hour after an online purchase. With the help of buckets, the drones are designed to handle loads of up to five pounds, which account for about 86% of Amazon deliveries.

"It will work, and it will happen, and it's going to be a lot of fun," Bezos said of the company's so-called Prime Air project. Bezos predicted the drones would take to the skies within five years. However, some saw the interview as a huge publicity stunt to promote Amazon.com during the Christmas season.

A spokesperson for the Association for Unmanned Vehicle Systems International, said

Amazon's proposal showed the promise of UAVs but, in the near term, the FAA may allow such aircraft to fly only within the operator's line of sight.

"Drones hold the promise of companies anticipating our every need and delivering without human involvement," said Tim Draper, a venture capitalist. "Everything from pizza delivery to personal shopping can be handled by drones."

PEPPERONI WAR?

Earlier this year, Domino Pizza, in the UK, asked a drone developer to build a drone that could deliver pizza. Its initial flight and delivery was successful, but *en masse* deliveries are still in the future. The down side of this is delivery people will probably lose their jobs to drones, but at least you won't have to tip the drone.

It could also start a pepperoni war where a Pizza Hut drone fires lasers at the Domino's drone, burning the cheese, and scattering your pizza across the landscape.

Serge Wich, a primate biologist, launched several drones in Sumatra last December with his non-profit group, Conservation Drones, in an attempt to map the nesting spots that orang-utans make at night. The images will be used to help the government protect national park land from being opened to developers interested in farming palm trees to produce palm oil.

ISSUE STALLED

In the US, the Federal Aviation Administration does not yet let drones deliver pizza. The FAA has effectively grounded the commercial drone business in the country for at least another two years while it studies the impact on safety and personal privacy of countless flying machines in the airways.

However, the agency is working on a plan to integrate unmanned systems into domestic airspace. FAA Administrator, Michael Huerta, told a Congressional Committee in January that the agency would meet its goal of December 30, 2015, for safe integration of drones in the national airspace system. If that happened, then estimates were that perhaps 7 500 would be in the air by 2020 — most of which would likely be small machines resembling model airplanes.

Huerta said the FAA would provide data to assist in developing regulations and certifications for drones to operate in US airspace. Drones ranged from small vehicles to large, heavy craft and each could require different certifications, he added.

Today, only US government agencies, a few public universities and a handful of private companies hold FAA permits to fly private drones.



Top: Amazon's Quadrocopter made a sensational debut in a video commercial during the last Christmas season. The reality is the practical use of this technology is still years away. **Centre:** A surveillance drone used by Merseyside Police (UK), is one of three forces that have permission to use UAVs. **Above:** This drone is equipped with the appropriately named Gorgon Stare sensor package that can survey an area 2½ miles across from 12 angles at once. Its field of view swallows entire cities. This drone tracked down a cop-killer, but can be adapted to various civilian applications.

But that is not stopping some realtors. Some are using a 1981 FAA advisory regulating model aircraft as the basis for standards for small drone flights, advising pilots to stay below 400 feet, and notify any airports less than three miles away of their presence.

An FAA spokesman said that until the FAA drafted regulations governing commercial use of drones, operators could not sell video they shot with them, or use them to promote a business. The FAA would send a drone operator a cease-and-desist letter if it became aware of any such commercial use, he said.

One aerial photographer in Arizona was assessed a \$10 000 fine by the FAA, and has taken the agency to court challenging its jurisdiction.

NEAR FUTURE

The use of drones will increase substantially in coming years, and the variety of uses and sizes has some communities already threatening to ban or place their own restrictions on drones.

The question is how extensive are airports and air travel, both private and commercial, in those areas, and how can safeguards be created?

It does appear that the RMAX does well on safety, but it is going to be a battle to get that type of aircraft accepted in areas other than rural areas where there is less chance of an incident.

Also, remember that many people in the United States fear the Big Brother issue...real or not.