

Is There A Commercial Market For Large Unmanned Aircraft?

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Where is the commercial market for large unmanned aircraft systems (UAS)? When the aviation community began thinking about how to open the skies to unmanned aircraft, it was assumed they would be large, long-endurance machines sharing controlled airspace with manned aircraft.

But the market went in a different direction. Small UAS, or drones, weighing less than 55 lb.—many much less—became the name of the game. Instead of a handful of established aircraft manufacturers, startups by the score emerged to push regulators to open up access to uncontrolled airspace below 400 ft.

And small UAS keep getting more capable as payloads become smaller, allowing drones to carry multiple sensors, stay in the air longer, or both. Such is the potential in vehicles under 55 lb. that at the Association for Unmanned Vehicle Systems International's Xponential show in Dallas on May 8-11, there was a session entitled "Don't Count Out Large UAS in the Commercial UAS Game."

The presenters were from AeroVironment, General Atomics Aeronautical Systems, Northrop Grumman and NASA—all of which were once on the government-backed Access 5 project that aimed to enable safe and routine access to the U.S. national airspace system (NAS) for high-altitude, long-endurance UAS.



Credit: NASA

Although Access 5 ended in 2006 after two of a planned five years, government-supported research on airspace access for UAS has until recently tended to focus on larger, higher-flying

aircraft. NASA's UAS in the NAS project is centered on the command-and-control (C2) and detect-and-avoid (DAA) systems needed for UAS to operate in controlled airspace. Although not explicitly linked to large UAS, these systems are not designed for small drones.

Under UAS in the NAS, NASA and industry conducted flight tests to collect data to support standards body RTCA's development of performance specifications for the certifiable C2 data link and DAA radar sensor needed to operate in Class A airspace (above 18,000 ft.) under instrument flight rules. RTCA is now working on DAA equipment specifications to expand operations into controlled airspace below 18,000 ft., where visual flight rules apply, and may also reach down into uncontrolled airspace.

This work implicitly applies to bigger UAS because of the space, weight and power required for the equipment, but is not restricted to the large aircraft envisioned by Access 5. "Low-altitude UAS are coming up in capability, and large aircraft are miniaturizing," says UAS in the NAS Deputy Program Manager Davis Hackenberg. "There could be a lot of stuff above 55 lb. but not that large."

An example is Insitu's Integrator, which at 135 lb. is above the FAA's weight limit on small UAS but far lighter than General Atomics' 10,500-lb. MQ-9 Reaper or Northrop's 32,250-lb. RQ-4 Global Hawk. Integrator was recently flown with Logos Technologies' Redkite wide-area motion imaging (WAMI) sensor, which can track all the "significant movers" within a city-size area. Once a large podded sensor that could be carried only by a Reaper, WAMI has been shrunk down to less than 85 lb.

Which raises the question of where are the markets for large UAS? AeroVironment is still pushing its SkyTower concept of persistent solar-powered UAS flying at 60,000-80,000 ft. to provide communications services (see photo). Facebook's Aquila is a similar concept, as is Airbus's Zephyr, but while these machines are large, they are not heavy. Aquila has a wingspan of 138 ft. but weighs only 934 lb. Zephyr weighs just 137 lb. Such vehicles will be handled like satellites, with one crew managing a constellation of aircraft.

General Atomics is looking at the commercial market for the type-certifiable version of Reaper, called SkyGuardian, now under development. This is a 12,500-lb. UAS that can fly for 40 hr. at 40,000 ft. carrying a 4,000-lb. payload. If there is a commercial market, it is likely for an aircraft that can carry multiple sensors long distances and service multiple customers at the same time, says Peter McNall, manager of strategic business development at General Atomics.

Missions could include communications relay, long linear inspections of rail, power and pipelines, border security and fisheries protection. Other missions for more specialized large

UAS could include crop spraying and cargo carrying. "Freight is where I see the industry going," says McNall. But for now, he admits, "We are not seeing a market pull to large UAS."