

Stratolaunch engineer

What's with the paper airplane?

Remembering Apollo 8's launch

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2018

YEAR IN REVIEW



Commercial space enterprises, airspace integrators make test progress

BY KARL GARMAN AND ANDY FREEBORN

The **Flight Testing Technical Committee** focuses on testing of aircraft, spacecraft, missiles or other vehicles in their natural environments.

▲ **The Stratolaunch** continued taxi tests at California's Mojave Air and Space Port.

In commercial spaceflight testing, Stratolaunch, the rocket-launching mothership with the largest wingspan in history, continued taxi tests this year. The California-based company hopes to provide airport-style access to low Earth orbit, as envisioned by Paul Allen, Stratolaunch founder and Microsoft co-founder who died in October.

As part of its efforts to enter the commercial space tourism market, **Virgin Galactic resumed test flights in April of its SpaceShipTwo**, the VSS Unity. The WhiteKnightTwo carrier aircraft released the Unity over Mojave, California. Unity's two pilots flew the prototype tourism craft to Mach 1.87 and an altitude of 84,000 feet, the company said.

SpaceX in February launched a Falcon Heavy rocket for the first time. During the demonstration, two of the vehicle's boosters flew back to and landed on designated landing zones in Florida as planned, but the third booster was lost at sea after the vehicle released a Tesla Roadster as a demonstration payload. The Falcon Heavy has the highest payload capacity of any operational rocket.

In July, Blue Origin took another step toward flying tourists to space when its **New Shepard spacecraft exceeded an altitude of 118 kilometers in an uncrewed test — higher than any previous commercial suborbital space flight test.**

U.S. government and industry partners made progress toward integrating drones into the National Airspace System, with tests of the FAA-developed Low Altitude Authorization and Notification Capability. LAANC is a computer application that provides air traffic separation services at low altitudes. Flight testing was implemented in six waves involving approximately 300 air traffic

facilities and 500 airports from April through September. LAANC processes airspace notifications in near real time and automatically approves appropriate requests to access the airspace.

In May, the U.S. Department of Transportation's Unmanned Aircraft Systems Integration Pilot Program, or UAS IPP, selected 10 diverse cooperative flight testing proposals. The aim of the UAS IPP is to further integrate unmanned aircraft into the airspace and reduce risks to public safety and security. The selectees started a three-year test effort focusing on nighttime and beyond visual line of sight operations, flights over people, detect-and-avoid technologies and data link security.

This year, **multiple entities announced flight testing of urban air mobility or "flying taxi" test vehicles with various levels of automation.** In February, the EHang company of Guangzhou, China, released footage of its Model 184 pilotless aircraft showing a flight test with a person aboard. In March, Kitty Hawk Corp. of California revealed an experimental flight test program for its Cora unpiloted air taxi in New Zealand, which was to continue throughout 2018.

Community noise impacts from potential urban air mobility operations are of concern for these emerging stakeholders as well as traditional stakeholders. NASA concluded a multiyear series of flight tests in May to assess acoustic performance of conformal flaps, main landing gear and gear cavity noise reduction treatments. Two NASA Gulfstream G-III test aircraft completed approximately 1,100 passes over microphone arrays. These flight test data will help refine advanced noise prediction methodologies to foster further acoustic improvements in the commercial transport fleet.

In the military realm, the Boeing-built KC-46A tanker aircraft completed developmental flight testing, culminating in an FAA Supplemental Type Certificate issued in September. The test program was to transition to proving full operability of the air refueling systems and preparation for initial operational test and evaluation. The multiyear flight test campaign included approximately 1,600 refueling contacts and 2,200 flight hours. The tanker, based on a Boeing 767 airframe, involves several modifications from the civil airframe.

For passenger flight, Boeing completed its 787-10 and 737-9 MAX flight testing programs, achieving a certification in January for the 787-10 and in February for the MAX. ★

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