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SpaceX Falcon 9 Rocket Sends Japanese Satellite Into Orbit, Sticks Landing Upon Return To Earth.

[CBS News](#) (8/14) reports that a SpaceX Falcon 9 booster launched a Japanese communications satellite into orbit on Sunday, “lighting up the deep overnight sky as it climbed away from Cape Canaveral on a jet of fiery exhaust.” While the second stage of the booster sent the payload for Sky Perfect JSAT Corp. into geostationary transfer orbit, “the first stage successfully flew itself back to landing on an off-shore drone ship, the California rocket builder’s sixth successful booster recovery in 11 tries.” The landing marked the latest effort by SpaceX to reduce launch costs by “recovering, refurbishing and re-launching spent stages.” **Is booster recovery becoming routine?**

Zipline Set To Test Medical Drone Deliveries With White House Support.

[TechCrunch](#) (8/12) reported that following recent approval from the White House, robotics start-up Zipline is set to soon demonstrate the “viability of unmanned aircraft technology in disseminating critical care supplies” to hard-to-reach locations. According to the article, Zipline is teaming up with Ellumen, ASD Healthcare, and Bloodworks Northwest “on test deliveries of medical supplies in Washington, Nevada, and Maryland.” The article notes that Zipline’s testing program “could influence the national framework for the U.S. commercial drone sector – projected to generate \$82 billion in revenue by 2025.”

Eighteen-Year-Old Teal CEO Discusses Building World’s Fastest Consumer Drone.

[CNBC](#) (8/12) featured a profile of 18-year-old George Matus, the CEO of drone and software company Teal, “which sells the fastest consumer drone in the world.” The article noted that by the age of 12, George had constructed his own operational quadcopter, “and was working with drone companies to test every product on the market.” Speaking to CNBC about the development of Teal’s high speed drone, Matus said that the company “wants to give racers something that works out of a box, ...something they don’t have to tinker with.”

V1 Aeronautics Offers Courses In Commercial Drone Pilot Certification.

The [Chambersburg \(PA\) Public Opinion](#) (8/13) reported that FAA-approved flight school and knowledge testing center V1 Aeronautics based out of the Hagerstown Regional Airport in Hagerstown, Maryland “is accepting students for its new commercial drone pilot certification courses,” a “two-day course” that teaches students how to operate UAS “for commercial use to pass the Federal Aviation Administration’s written aeronautical knowledge test and earn a remote pilot certificate with a small unmanned aircraft systems rating.”

Tiny Satellites: The Latest Innovation Hedge Funds Are Using to Get a Leg Up

The latest technological innovation for data-hungry hedge funds is a fleet of five dozen shoebox-sized satellites By BRADLEY HOPE Aug. 14, 2016 4:37 p.m. ET

The latest technological innovation for data-hungry hedge funds is a fleet of five dozen shoebox-sized satellites. A company called Planet Labs Inc. has launched a small constellation of what it calls “cubesats” that can deliver much more frequent imagery of economically sensitive spots than traditional satellites. Those spots include retailers’ parking lots, oil-storage tanks or farmland.

The company, founded by three former NASA scientists, has now signed an agreement to supply data to Orbital Insight Inc., which mines satellite imagery for trading tips for hedge funds. Until now, Orbital has relied on monthly or

bimonthly imagery for its analysis. The deal with Planet Labs will give them access to weekly images at first. Next year, if Planet Labs succeeds in a plan to launch another 40 or so cubesats, Orbital will have access to daily images of every piece of land on earth.

<http://www.wsj.com/articles/satellites-hedge-funds-eye-in-the-sky-1471207062>

For smallsats, launch options big and small

by Jeff Foust Monday, August 15, 2016

Interest in small satellites is greater than ever before. Companies are developing constellations of smallsats, ranging from CubeSats weighing a few kilograms to custom-designed spacecraft weighing a couple hundred kilograms, for communications, remote sensing, and other applications. OneWeb, for example, raised \$500 million last year to begin development of a 650-satellite system, and is about to break ground on a factory outside the gates of the Kennedy Space Center in Florida where most of those satellites will be assembled, at a peak rate of 15 per week. Waiting in the wings are concepts proposed by Boeing and SpaceX for constellations that could number in the thousands of satellites.

Another metric in smallsat growth is attendance at the 30th Annual Conference on Small Satellites, held every August on the campus of Utah State University in Logan. Attendance in recent years has soared, with more than 2,200 at this year's conference last week. A workshop devoted to CubeSats held the weekend before the main conference, which in its early years could fit inside a classroom, had nearly 1,000 people this year.

And this year, like in the previous three decades, one key topic of discussion was how to launch smallsats. With the growth of satellite constellations that, combined, will require thousands of satellites in the next decade, developers of small launch vehicles see a rich market that they believe could support multiple vehicles. They will have to compete, though, with larger launch vehicles offering new solutions for satellites willing to hitch a ride.

Rocket Lab, a company headquartered in the US but with most of its operations in New Zealand, is working on its Electron small launcher, capable of placing 150 kilograms into a sun-synchronous orbit. Earlier this year, the company said its first flight, from a launch site on New Zealand's North Island, was planned for mid-year. That schedule has slipped a bit.

If it sticks to that schedule, it will be followed later next year by Virgin Galactic's LauncherOne. That vehicle, first announced in 2012, originally was to launch from the same carrier aircraft, WhiteKnightTwo, as the company's SpaceShipTwo suborbital vehicle. Late last year, though, the company announced it was purchasing a Boeing 747—previously owned, by coincidence, by Virgin Atlantic—to serve as the new LauncherOne aircraft.

The 747 will increase LauncherOne's payload capacity to 300 kilograms for sun-synchronous orbits. Launches will begin in the second half of next year, he said, initially flying out of the Mojave Air and Space Port, which supports sun-synchronous and other high-inclination orbits. The company is also

looking for sites to fly out of for launches to lower inclinations; Charania didn't mention any, but his slides showed both KSC and [Virginia's Wallops Flight Facility](#) as two potential options.

Firefly Space Systems is working on its Alpha vehicle, with an initial payload capacity of 200 kilograms to a sun-synchronous orbit. "Firefly Alpha is our approach to get to space as quickly as possible," said company CFO Michael Blum. "This is not the highest performance vehicle that you could come up with, but it is the one that you can develop the quickest and the cheapest." It's looking to start flying the Alpha in 2018, with its manifest of flights that year sold out and most of 2019 also sold out, he said.

A newer entrant in the small launch sector is Vector Space Systems. It is developing the Vector One rocket based in part on a nanosatellite launch vehicle concept Garvey Spacecraft Corporation, formally acquired by Vector last month, had been working on for several years. As the name suggests, it is focused on the smaller end of the market, with a payload capacity of about 50 kilograms.

Is there really enough demand, though, for even the four companies—Firefly, Rocket Lab, Vector, and Virgin—on stage at the side meeting, let alone the many more in the audience and elsewhere? "We see a big demand from a domestic US standpoint as well as internationally," said Rocket Lab's Schneider. "I think we could sustain a nice business model."

And the competition for small launch vehicles doesn't come from just among themselves. Today, most smallsats are still launched as secondary payloads, either taking advantage of excess payload space on various launches or flying as cargo to the International Space Station to be later deployed from there. Those options are not going away in the near future.

<http://www.thespacereview.com/article/3044/1>

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Study Finds Use Of Fixed-Wing Drones Lags Behind Quadcopters In Commercial, Industrial Markets.

[TechCrunch](#) (8/15) reports that a newly released study by DroneDeploy indicates that the use of quadcopters is rapidly outpacing the use of fixed-wing drones in every industry. The article notes that while fixed-wing drones can typically fly longer distances and cover larger areas than quadcopters, they are also "used in just 6 percent of the flights for commercial and industrial purposes." By comparison, quadcopters, "which promise to be easier for drone operators to control in flight and allow for rapid takeoff," are used much more extensively. DroneDeploy CEO and Co-Founder Mike Winn explained, "People would rather fly a quadcopter multiple times over a large area, or stop to change batteries, than go through the process of assembling a fixed-wing drone before a flight."

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Tiny UAS Impresses at Military Technology Testing Exercises in Hawaii

By AUVSI News posted 7 days ago

Tiny unmanned aircraft systems might soon be used by the military, after a successful test of the PD-100 at the Pacific Manned-Unmanned Initiative (PACMAN-I) in Hawaii. The PD-100 is small enough to fit into someone's hand, and has an operational range of nearly 8,000 feet. The PD-100 takes minutes to prep for flight and has a flight time of approximately 25 minutes. Its primary responsibility will be transmitting video of adversaries through its three cameras. The video footage will be sent to the operators of the UAS. With the PD-100 being so small and also being noiseless, it'll be relatively undetectable while out in the field.

The PD-100 was developed by Prox Dyn Dynamics, a company that specializes in micro helicopter technology. According to the company website, some of the PD-100's missions can include search and rescue, object identification and crowd control.

Aurora looks to expand unmanned flight operations Aug 16, 2016

Aurora Flight Sciences of Manassas is looking to expand its operational testing of the Centaur Optionally Piloted Aircraft system to Lonesome Pine Airport in Wise County. Through this endeavor, Aurora aims to continue advancing the Virginia Unmanned Systems Commission's progress toward making the state a leader in the unmanned systems industry while also establishing Wise County as a research, development and operational hub for unmanned aircraft systems (UAS,) according to a news release.

Aurora will initially use the Centaur OPA system, a large UAS, to collect a variety of critical data for the state using advanced sensor technologies, and support the Mountain Empire Community College in developing the first of its kind Aerial Drone Geo-Spatial Mapping and Surveyors course. The Centaur, developed by adding autonomy-enabling technology to the passenger seat of a DA-42 aircraft, provides ultimate flexibility for airborne sensing, testing and training by enabling the aircraft to be flown as a UAS or as a piloted aircraft. In its unmanned mode, the Centaur can spend 14 to 20 hours in flight to conduct missions that are too dull or dangerous for on-board pilots to execute.

For the new Wise County operations, Centaur will either be flown on-board by the pilot or in the Hybrid mode with an on-board safety pilot. Some of the jobs targeted for Centaur include mapping and survey; predicting and detecting forest fires; performing large-area (multi-state) inspections on roads, railroads, power lines, and waterways; performing mineral and vegetation mapping; and conducting emergency management operations.

http://www.insidenova.com/news/business/aurora-looks-to-expand-unmanned-flight-operations/article_5d9cb09a-60ae-11e6-b2ac-efb4eeb17ec8.html

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EU Agency Issues Tender For UAV Coastal Monitoring Services.

[Flightglobal](#) (8/17) reports that the European Maritime Safety Agency (EMSA) has issued a request for proposals (RFP) to contract remotely-piloted air systems (RPAS) services for “maritime surveillance of fisheries, vessel monitoring and detection, and border control missions.” According to the article, the EMSA is looking for three classes of UAVs, including “a large, long-endurance, multi-sensor UAV; a medium, long-endurance system below 150kg and a short-range, vertical take-off and landing system that can operate from both land and ships.” In addition, the RFP states that new service “will facilitate member states with carrying out their coastguard tasks at national or EU level.”

Airbus To Experiment With “Flying Driverless Taxis” In 2017.

[CNBC](#) (8/17) reports that Airbus is developing a “flying driverless taxi” that can be hailed via smartphone app. In an article on its website titled “Future of urban mobility: My kind of flyover,” the France-based aircraft manufacturer “said the first vehicle prototype could be built and tested as soon as end of next year as part of a project known as ‘Vahana.’” In the article, which was published on Wednesday, Airbus Project Executive Rodin Lyasoff explained, “Many of the technologies needed [for the vehicles], such as batteries, motors and avionics are most of the way there,” adding that in as few as 10 years, “we could have products on the market that revolutionize urban travel for millions of people.”

NASA Rocket Loses Student Experiment Payload Over Atlantic Ocean.

The [AP](#) (8/17) reports that NASA disclosed on Wednesday that it lost “the payload of a suborbital rocket carrying student experiments into the atmosphere as it returned to Earth, a rare occurrence that’s being investigated.” The payload, which included high-definition cameras, different gauges and antennas, was launched from the Wallops Flight Facility in Virginia and reached an altitude of about 95 miles before descending toward the Atlantic Ocean. NASA spokesman Keith Koehler said that the agency was able to retrieve data from most of the experiments aboard the rocket. Kohler added, “We don’t know why we couldn’t find it,” noting, “It’s a big ocean. They’re going to have go through the data and determine what happened.”

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UK Orders Third Zephyr-S UAV For Demonstration Project.

[UPI](#) (8/18) reports that the UK Ministry of Defense announced on Thursday that it has placed an order for a third solar-powered Zephyr-S UAV as part of a \$16.9 million contract deal with Airbus Defense and Space. The UAV will be part of a 2017 demonstration project to assess its potential use by the UK military. The article explains that the Zephyr-S can fly at altitudes as high as 70,000 feet for up to 45 consecutive days at a speed of 35 miles per hour. In addition, the aircraft is often referred to as a High Altitude Pseudo Satellite (HAPS) since it behaves more similarly to a satellite than a conventional UAV.

[Space News](#) (8/18, Subscription Publication) notes that the Zephyr-S is also designed to offer “a range of persistent surveillance and communications services.” Additionally, Airbus said that the aircraft “can be used for humanitarian missions, precision farming, environmental and security monitoring, and to provide internet coverage to regions of poor or zero connectivity.” British Defense Secretary Michael Fallon said in a statement, “Zephyr is a cutting-edge, record-breaking piece of kit that will be capable of gathering constant, reliable information over vast geographical areas at a much greater level of detail than ever before.”

DARPA Seeks New Anti-Drone Weapon By 2020.

[Popular Science](#) (8/18) reports that DARPA has issued a request for information to identify “novel, flexible, mobile layered defense systems and component technologies that could be leveraged to improve force protection against a variety of sUAS (small unmanned aerial system) threats and tactics.” The solicitation requests that such systems be “structured to rapidly evolve with threat and tactic advancements,” and to be available by 2020. In addition, DARPA asks that the systems also “address rocket, artillery, mortar, and other conventional threats.” The article notes that the weapons that currently are able to do so are “mostly lasers,” and that Israel and Germany both have displayed anti-drone laser weapons at military trade shows.

Air Force Envisions Critical Role Of Small Autonomous Drones In Future Combat.

[Military](#) (8/18) reports that the US Air Force foresees being able to deploy swarms of small autonomous drones from an aircraft anywhere in the world within 24 hours in order to project aerial power. Speaking at the UAS Midwest conference on Wednesday, Col. Brandon Baker, who heads the Air Force Remotely Piloted Aircraft Capabilities Division, explained that part of this “game changer” technology involves the autonomous vehicles communicating with each other while directed by one or two human operators in the command and control loop. According to Air Force Chief Scientist Greg Zacharias, who also spoke at the conference, autonomous technology is expected to play an increased role in future drones. Zacharias remarked, “The Air Force is clearly looking toward this as a fundamental technology.”

Workhorse Offers Drone Delivery System That Complies With FAA Rules.

[CNBC](#) (8/18) reports online that “while Amazon is tussling with regulators over drone deliveries,” Workhorse’s “HorseFly” system allows companies to make drone deliveries while adhering to the FAA’s regulations “by launching them out of the roof of a truck.” This keeps drones within the operator’s line of sight. Workhorse CEO Steve Burns told CNBC that the “efficiencies are not as good as if you could just launch from 30 miles [a]way, but they are staggering.” CNBC mentions that Amazon is testing drones in the UK in partnership with the UK government, and a recent patent unveiled Amazon’s potential plans to keep drones “perched in high places like lampposts ready to be deployed at any time.”

Army Seeks New Smallsat Imaging And Space Situational Awareness Sensors.

[Space News](#) (8/18, Subscription Publication) reports that Julie Schumacher, deputy to the commander of the Army’s Space and Missile Defense Command/Army Forces Strategic Command, spoke at the Space and Missile Defense Symposium on Aug. 18, where she “highlighted several technologies the service continues to seek out from industry as its small satellite program moves forward.” According to Space News, those technologies include laser communication, small sensors that can help with imaging and space situational awareness, and “high capacity electronics and processors that would reduce the size, weight and power required by those systems.” The US Army has launched 10 small satellites since 2010, including three experimental communications satellites in October as part of a National Reconnaissance Office mission. Schumacher said the communications satellites “are expected to remain as technology demonstrations in the near future and are not expected to become full programs of record.”

Advocacy CEOs: New Best Practices Tap Drone Potential, Preserve Privacy.

In an op-ed for [TechCrunch](#) (8/18), Brian Wynne, president and CEO of the Association for Unmanned Vehicle Systems International, and Nuala O’Connor, president and CEO of the Center for Democracy and Technology, write that drones have “the potential to revolutionize our lives in many ways,” but they note that the technology has raised

privacy concerns among many. The authors explain that given these concerns, UAS industry stakeholders have been collaborating to help enable “the safe, responsible and ethical use of drones,” while also supporting the continued development and expansion of this “cutting-edge technology.” Wynne and O’Connor write that the collaborative effort over several months has led to “a consensus set of voluntary best practices that balance people’s rights to operate drones with all of our rights to privacy.” The authors conclude that through continued collaboration, stakeholders “can ensure that civil liberties are protected” while fully leveraging the economic and social benefits of UAVs.