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SpaceX Blast Threatens to Leave NASA in a Bind

With timetable for U.S. spacecraft in doubt, agency faces prospect of costly stopgap for space-station crews

By Andy Pasztor Sept. 5, 2016 7:19 p.m. ET

The explosion of a Space Exploration Technologies Corp. rocket during ground tests last week has added urgency to a key question for NASA: When will U.S. spacecraft be ready once again to carry astronauts into orbit?

The accident involving billionaire Elon Musk's company turned its roughly 15-story-tall Falcon 9 rocket into a fireball, destroyed a commercial satellite on board and damaged the launchpad at Florida's Cape Canaveral Air Force Station.

It is too early for investigators to conclude exactly what caused the accident or what it means for SpaceX, as the Southern California company is called, or its commercial customers, who already are fuming about launch delays. But the incident has space experts questioning projections that U.S.-built boosters and capsules, including the Falcon 9, are likely to start ferrying U.S. crews to the international space station in less than two years. If that forecast turns out to be too optimistic, top officials of the National Aeronautics and Space Administration might decide to reserve extra seats, costing more than \$81 million each, on Russian space vehicles as a stopgap.

Over the weekend, SpaceX said it began "the careful and deliberate process of understanding the causes and fixes" for the blast. "The pad clearly incurred damage, but the scope has yet to be fully determined," the company said, adding it was confident that two alternate launchpads could fulfill its launch needs. **Wallops?**

http://www.wsj.com/articles/spacex-blast-threatens-to-leave-nasa-in-a-bind-1473117555?mod=WSJ_TechWSJD_moreTopStories

Elbit's Hermes 450 Demonstrates Commercial Large-UAS Capabilities.

[Aviation Week](#) (9/6) reports that Elbit Systems of America CEO Raanan Horowitz said that the company is planning to offer commercial services using a company-owned fleet of Hermes 450 UAS. Elbit has completed 50 hours of flight testing for agricultural data-collection with the UAS and has conducted first flights to demonstrate the UAS' ability to inspect power lines for damage. Horowitz said, "With what we have been able to demonstrate, I am convinced that large-scale UAS have significant advantages in the areas of coverage, resolution, altitude and payload. We see small UAS as a companion solution."

AeroVironment Partners With General Dynamics Mediarware On Micro Air Vehicle.

[Australian Defence Magazine](#) (9/6) reports that today UAV manufacturer AeroVironment "announced it is teaming with Australia-based XTEK, Sentient Vision and General Dynamics (GD) Mediarware" to offer its AeroVironment Wasp AE Micro Air Vehicle (MAV) to the Australian market. The article describes the MAV as having "a 29-inch wingspan...designed for ground and water landing, making it suitable for both land and maritime missions." The MAV "carries interchangeable payload modules and incorporates the smallest of AeroVironment's Mantis suite of miniature gimbaled payloads, the 275 gram Mantis i22 AE, giving operators both color and infrared video imagery from a single sensor package."

Virginia Tech Planning “Automation Park” To Test UAVs.

The [AP](#) (9/3) reported that Virginia Tech Transportation Institute is planning to build “a 300-acre test bed for drones and self-driving cars” that would “aim to replicate real-world driving and flying conditions for scientists.” The automation center would include “street signs, stoplights, roundabouts, curves, hills and even portable buildings that manufacturers would be able to use to test their automation technologies of the future.” The university expects to fund the center in part by charging fees to companies that conduct research there.

Amazon Builds Walls Of Hay Around UK Drone Test Site.

The [Daily Mail](#) (9/2) reported that Amazon erected walls made of haybales around its “multi-million-pound drone testing” facility in the Cambridgeshire countryside to hide the secret site. People have spotted “a blue control tower with aerials” on the property, and engineers over “the last few days” have been seen placing landing mats on the site to test landing accuracy. The article noted that the company applied for a collision avoidance system patent and speculated Amazon could also be testing that there. The Daily Mail included photos of the test site.

US Navy Considers Mayport, FL, For UAS Maintenance Hub.

The [AP](#) (9/5) reports that the US Navy is accepting public comments until October 1 “on a draft study that says there will be no significant environmental impact on the area if Mayport, [Florida,] becomes a home base for a drone program.” Mayport is “under consideration for the basing and maintenance of the MQ-4C Triton Unmanned Aircraft System,” as the Navy seeks “a launch and recovery site for four drones on the base, as well as a maintenance hub for up to four more unmanned aircraft.” [Wallops competitor...](#)

AUVSI Chapter President Seeks Faster Commercial UAS Rule Development.

The [Baton Rouge \(LA\) Advocate](#) (9/4) featured an interview with the Association for Unmanned Vehicle Systems International’s (AUVSI) Pelican Chapter President R. George Rey Sr., who said that the FAA should craft rules governing commercial UAV use more quickly. Rey said that the “biggest” outcome of the new commercial UAV regulation is that a UAS operator is not required to obtain a pilot’s license.

Analysis: FAA Rules Permitting Commercial UAS Will Expand Counter-UAS Market.

In his “Fedbiz Daily” blog for the [Washington Business Journal](#) (9/2, Subscription Publication), columnist James Bach highlighted the opinion that the counter-UAS market will expand in response to new FAA rules, enacted last Monday, which ease regulatory hurdles on commercial UAS use. Bach cited CACI’s 2015 roll-out of Skytracker, “a tool for detection, identification and tracking of drones operating unlawfully in protected airspace.”

Bloomberg News Highlights Case IH’s Autonomous Vehicle.

[Bloomberg News](#) (9/2) highlighted Case IH’s Autonomous Concept Vehicle, noting that “it comes equipped with cameras, radar and GPS, allowing a farmer to remotely monitor planting and harvesting via an app on a tablet computer.” Agricultural machinery companies, the article observed, “are keen to add the latest technology amid growing interest in the use of big data analysis, drones and satellite imaging.” However, these advances have caused some consternation among farmers who do not want corporations “holding onto data gathered from their fields.”

DARPA Develops UAS Technology That Prevents Signal Jamming.

[Federal Computer Week](#) (9/2) reported that as the “widespread use of unmanned aerial vehicles is rapidly unfolding,” DARPA is working on wireless communications technology “that would better protect the radio signals that control

drones to stop miscommunication and intentional jamming.” DARPA said its Hyper-wideband Enabled RF Messaging program “could be the foundation of secure communications.”

Transportation Secretary Foxx Discusses Challenges In Crafting Commercial UAS Rules.

Emily Chang for [Bloomberg TV's Bloomberg West](#) (9/5, 6:45 p.m. EDT) discussed the new UAS regulations with Verifly co-founder and CEO Jay Bregman, who said he doesn't “think more regulation is needed” for hobbyists. Instead, he said he thinks “more education is needed” so that people are aware of the limitations. Chang shared a clip of Transportation Secretary Anthony Foxx's comments last week, in which he discussed the complexities of integrating the different “commercial uses, hobbyists, airplanes” and other UAS uses into a single comprehensive regulatory system.

European Aviation Industry Urges Stricter Commercial UAS Regulation.

[Reuters](#) (9/5) reports that in Europe yesterday, aviation associations issued a joint statement calling for a “mandatory registration and training” of UAS operators “following a number of near-misses between the unmanned devices and aircraft.” Britain's Civil Aviation Authority “issued a warning last year after seven incidents in less than 12 months in which drones had flown near planes at different British airports.” China's DJI “has built geofencing into apps controlling its drones, preventing them from flying into sensitive areas,” Reuters notes.

senseFly Launches eBee SQ Precision Agriculture Drone

Published: 02 Sep 2016

senseFly has expanded its portfolio with the launch of the new eBee SQ fixed-wing agricultural drone. This unmanned aircraft system (UAS) is built for the Parrot Sequoia multispectral camera and can cover up to 10 times more ground than small quadcopter drones. The Sequoia multispectral sensor captures data across four highly distinct spectral bands (near-infrared, red-edge, red and green) plus visible RGB imagery. Once the drone's images have been processed, using a solution such as Pix4Dmapper Ag/Pro (Desktop & Cloud) software or cloud-only solutions such as MicaSense ATLAS and AIRINOV's, the Sequoia's broad spectral data enables numerous vegetation indices to be computed including NDVI, NDRE, MCARI and CCCl. The resulting index maps can then be employed to assess factors such as a plant's chlorophyll levels, a key indicator of crop health. With Pix4Dmapper Ag/Pro, these index maps can be further adapted to create exportable prescriptions (i.e. application maps), allowing professionals to carefully optimise their crop treatments to improve production quality, boost yields and reduce costs.

The eBee SQ can fly for up to 55 minutes on a single battery charge. This performance enables it to cover up to 500 acres (200 ha) in a single flight at 400 ft (120 m) above ground level. The result is fewer flights per project, for less time spent collecting data and more time acting on it.

http://www.unmannedsystemstechnology.com/2016/09/sensefly-launches-ebee-sq-precision-agriculture-drone/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=1b24cfc798-Unmanned+Systems+Technology+eBrief&utm_medium=email&utm_term=0_6fc3c01e8d-1b24cfc798-111778317

Warsaw University of Technology and Lockheed Martin Demonstrate UAV Optimization Technologies Published: 01 Sep 2016

WUT Lockheed UAVThe Warsaw University of Technology (WUT) and Lockheed Martin have announced the successful demonstration of their UAV optimization technologies using aerial command and control (C2) of multiple unmanned aerial vehicles (UAVs). The demonstration marks another successful milestone in the joint WUT-Lockheed

Martin advanced applied research program on optimization of diverse fleets of aircraft, and concepts associated with manned-unmanned command and control of airborne platform systems.

http://www.unmannedsystemstechnology.com/2016/09/warsaw-university-of-technology-and-lockheed-martin-demonstrate-uav-optimization-technologies/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=1b24cfc798-Unmanned+Systems+Technology+eBrief&utm_medium=email&utm_term=0_6fc3c01e8d-1b24cfc798-111778317

AtlantikSolar UAV Completes Fully Autonomous 26-Hour Search and Rescue Flight Published: 31 Aug 2016

The team behind the AtlantikSolar UAV has announced that the aircraft has completed what is claimed to be the first-ever fully-autonomous (from launch to landing) solar-powered perpetual flight with significant payload (Color + Thermal Camera) in a 26-hour search-and-rescue mission. While previous 81-hour and 28-hour endurance record flights were important milestones that demonstrated the perpetual endurance capability of AtlantikSolar, they required manual pilot control for launch and landing and did not carry any aerial imaging payload.

However, the latest flight demonstrated ease-of-use through full launch-to-land aircraft autonomy as well as significant payloads to help rescue teams with the detection of refugees on land and at sea. The 26-hour solar-powered Search-and-Rescue flight performed by AtlantikSolar is claimed to be the first-ever flight worldwide to combine:

Perpetual flight: 26-hours of solar-powered day/night flight

Full aircraft autonomy: No pilot stick moved within 26-hours of flight

SaR payload: The aircraft carried a 10 Watt 300g payload (1 Color camera, 1 Thermal Camera, 1 ODROID onboard computer with WLAN) and performed refugee detection from the air during day and night.

Environment awareness: The aircraft performed automatic thermal updraft tracking for increased energetic efficiency and to speed up the battery recharge.

As a final step, and after 26-hours of solar powered flight, the aircraft performed a fully autonomous landing at the Hinwil airfield. Using its lightweight LIDAR (Light Detection And Ranging) sensor to measure its distance to the ground, AtlantikSolar – a hard to fly aircraft that can usually only be steered and landed by extremely experienced pilots – safely performed the automatic landing. The team considers the demonstrated full flight autonomy a vital step to allow search-and-rescue support teams, which usually do not possess extensive UAV flight training, to benefit from the significant advantages of solar-powered and high-performance UAVs

http://www.unmannedsystemstechnology.com/2016/08/atlantiksolar-uav-completes-fully-autonomous-26-hour-search-and-rescue-flight/?utm_source=Unmanned+Systems+Technology+Newsletter&utm_campaign=1b24cfc798-Unmanned+Systems+Technology+eBrief&utm_medium=email&utm_term=0_6fc3c01e8d-1b24cfc798-111778317

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Cell Phone Networks Could Allow Beyond-Line-Of-Sight UAS Flights.

[Digital Trends](#) (9/6) reports that for Amazon's Prime Air UAS delivery service and other commercial UAS applications "to pan out at all, they will need a system of communication that allows them to travel farther, safer (and that will hopefully fend off doomsday scenarios)," and Qualcomm and AT&T are currently working on ways to enable "drones to connect to cell towers to achieve this goal," Wired reported. Qualcomm and AT&T hope that if they can demonstrate the effectiveness of their system, they will be able to overturn the FAA's ban on UAS flights beyond the operator's line of sight.

Little Arms Studios Develops Small UAS Training Simulator.

[Shephard Media](#) (9/6) reports that Little Arms Studios announced last week its creation of a small UAS training simulator called Zephyr, which "incorporates a learning management system that allows instructors to track trainees' progress." The developer said beta trials of the UAS have "led to improved features such as an updated drone physics model, improved usability, visual updates, and expanded controller support."

Krossblade's Quantum Tron UAS Touts Vertical Take-Off.

The [Daily Mail](#) (9/6) describes the Quantum Tron UAS, which takes off like a quadcopter but flies like an airplane or glider. Krossblade Aerospace Systems says the UAS can be used for creating 3D maps and deliveries, with "a top speed of 80 kilometers an hour, and a 160 kilometer range."

Insitu Orders Orbital Propulsion Systems For ScanEagle UAS.

[Shephard Media](#) (9/6) reports that Australia's Orbital announced Monday that it "will supply additional propulsion systems for the Insitu ScanEagle UAS under a USD\$9.7 million order." Orbital also said it "expects a long term consolidation agreement to cover ongoing supply to be signed by the end of 2016." The article briefly describes Orbital's UAV engine.

FAA Administrator To Address UAS Conference In Las Vegas.

The [Las Vegas Review-Journal](#) (9/6) reports that FAA Administrator Michael Huerta will be the first keynote speaker on Wednesday at the three-day InterDrone Conference in Las Vegas. InterDrone Chairman Ted Bahr said, "He's the top, top dog, and the fact that he's come out to address the commercial UAV (unmanned aerial vehicle market) at InterDrone is a real feather in the conference's cap," adding that there will be "a lot of chatter" about the FAA's Part 107 rule that went into effect last week.

FAA's Drone Advisory Committee Inaugural Meeting Set For Sept. 16.

[Aviation News Today](#) (9/6) reports that the FAA's Drone Advisory Committee is scheduled to hold its inaugural meeting on September 16. According to the FAA, the committee will meet "at least three times a year" to "discuss key issues and challenges associated with integrating unmanned aircraft in the world's busiest and most complicated airspace system."

New FAA Regulations To Lead To More UAS.

In continuing coverage, the [Tampa \(FL\) Tribune](#) (9/6) examines how the FAA's recent rules expanding the use of commercial UAS will lead to up to 600,000 commercial UAS in operation by this time next year. The Tribune cites the UAS Association of Florida, which says that "about a dozen localities" in the state are considering implementing their own unmanned aircraft regulations. St. Petersburg Police Officer Robert Lord pointed out that without local laws regulating UAS, police would not be able to enforce FAA regulations beyond taking an "observe and report" role.

Kespry Reveals Kespry 2.0 UAS By AUVSI News posted 8 days ago

On Monday, Kespry revealed their new Kespry 2.0 unmanned aerial system. The Kespry 2.0 comes equipped with a variety of upgrades, thanks in large part to a brand new battery, airframe and an improved flight system. Weighing less than two kilograms, the Kespry 2.0 is considered a micro UAS. The Kespry 2.0 has a flight time of more than 30 minutes, an operational height of up to 400 feet, and during its flight, it can cover 150 acres. It is also operational in 25 mph sustained winds, and 35 mph wind gusts. The flight time, coverage area and wind resilience are all twice as much as the previous Kespry UAS.

The Kespry 2.0 also has a new on-board lidar sensor that allows it to detect and avoid obstacles. It also has a lighter-weight and customized Sony industrial camera that's capable of allowing work to be conducted in the fields of mine planning, operations, inspection and safety.

<http://www.auvsi.org/blogs/auvsi-news/2016/08/30/kespry-reveals-kespry-20-uas>

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Photo Shows Amazon UAV Prototype In Flight.

The [Daily Mail](#) (9/7) features a photo of an Amazon Prime Air UAV prototype being tested in Cambridgeshire, UK, marking "the first time a prototype of Amazon's new delivery drone has been seen in action in Britain." The prototype hovered some 50 feet above the ground for two minutes before a group of engineers "picked up the device and made some adjustments." It was later spotted carrying a large cardboard package. A company spokesperson told the Daily Mail on Wednesday, "We are rapidly experimenting and iterating on Prime Air, working to make it a reality. This includes controlled testing of many different experimental vehicle components, designs, and configurations."

Yuneec Unveils Breeze UAV.

In a [USA Today](#) (9/7) feature, Jefferson Graham reports that Yuneec has unveiled its Breeze UAV, which sells for \$499, and compares it to DJI's Phantom 3 UAV. According to Yuneec, the Breeze is easier to fly than the Phantom 3, weighs less, and provides better video resolution. Graham describes his experience test-flying the Breeze in Los Angeles' South Bay area, and notes that the UAV's app offers a "Selfie" mode for taking pictures at eye level, as well as a "Follow Me" mode, "where the camera senses your presence and moves with you as you change locations."

Mercedes Unveils UAV Delivery Concept Van.

[MarketWatch](#) (9/7) reports that on Wednesday, Mercedes unveiled a concept vehicle called the Vision Van, which "can automatically deploy delivery drones, developed in partnership with drone-delivery startup Matternet, in which Mercedes announced what it labeled a multimillion-dollar investment." The article explains that the vehicle may be an effective compromise to the FAA's current UAV rules, which "stipulate that drones cannot fly beyond an operator's line of sight without a waiver." According to Matternet CEO Andreas Raptopoulos, the concept will also reduce the time and cost of on-demand deliveries.

Daimler to Work With Matternet to Develop Delivery Van Drones

Auto maker investing about \$560 million to design electric vans that can host aerial deliveries

By SARAH SLOAT and ILKA KOPPLIN Updated Sept. 7, 2016 5:51 p.m. ET 29 COMMENTS

Daimler AG said on Wednesday it would join with U.S. startup Matternet to develop drones for its delivery vans and invest €500 million (\$562 million) over the next five years in designing electric, networked vans. Daimler, the maker of Mercedes-Benz cars and trucks, acquired a minority stake in Menlo Park, Calif.-based Matternet as part of the partnership, a spokeswoman said. Daimler's overall investment in the initiative, called adVANce, will go to vehicle digitization, automation, robotics and mobility solutions technologies. "We are looking beyond the vehicle to the whole value chain and the entire environment of our clients," said van division chief Volker Mornhinweg. The goal is to turn vans into "intelligent, interconnected data centers," he said.

Just as car manufacturers are pushing into electric vehicles, logistics companies are turning to drones as a way to make parcel delivery faster and more efficient amid increasing urbanization and the growing popularity of e-commerce. Amazon.com Inc., China's JD.com Inc. and Germany's Deutsche Post DHL AG tested drone deliveries, even though regulatory hurdles have kept the technology largely grounded.

Daimler said its concept was "unique within the van sector," but the idea of launching drones from the rooftops of delivery vans is also one the U.S. Postal Service has been considering. Last year when the USPS called for bids to update its fleet, Ohio company Workhorse Group Inc. proposed adding drones to USPS vehicles. A spokesman for Workhorse, which has developed drones that can navigate to a specified delivery point from a vehicle's roof, said the USPS contract had not yet been decided.

<http://www.wsj.com/articles/daimler-to-work-with-matternet-to-develop-delivery-van-drones-1473260565> the

UK To Evaluate UAV Swarms For Defense.

[Directors Talk \(UK\)](#) (9/7) reports that the UK defense ministry is launching a public competition to evaluate how swarms of small UAVs could be used for warfare. The effort will be undertaken with Innovate UK and "calls for proposals on how lone drone operators could command UAS swarms in contested environments." The main use for such technology as conceptualized now is surveillance.

Largest Survey Yet Confirms Aid Groups in Favor of Using UAVs

WeRobotics co-founder Patrick Meier has been working with FSD on a number of Humanitarian UAV Research Projects since 2015. The results of one of these projects is finally public: The Drones in Humanitarian Actions Survey, funded by EU Humanitarian Aid. The purpose of this survey was to take a closer look at how humanitarian professionals view the use of aerial robotics or Unmanned Aerial Vehicles (UAVs). The survey asked aid workers working in different clusters what they think about the use of UAVs in different situations. Close to 200 disaster responders working across 61 different countries took part in this unique survey.

The results show that the majority of such professionals (60%) believe that UAVs can have a positive impact in disaster response operations, and that only a quarter (22%) view their use negatively in the wake of a disaster. But almost all humanitarian professionals surveyed (87%) said that they did not have first-hand knowledge of using UAVs, which is striking. When asked about the use of UAVs in armed conflict settings, 40% of the respondents believed UAVs should never be used in these situations, while 41% said they would consider using UAVs even in such cases.

Another interesting result was that a majority of those surveyed (57%) believed that local populations feel threatened by UAVs, even in non-conflict settings. But again 87% of those surveyed did not have first-hand knowledge of using UAVs. What's more, this perception is not backed up by the field experience of WeRobotics, Humanitarian UAV

Network, Drone Adventures, World Bank, International Organization for Migration (IOM) and FSD, to name just a few organizations that have actually used UAVs operationally in multiple countries worldwide.

<http://werobotics.org/largest-survey-yet-confirms-aid-groups-in-favor-of-using-uavs/>

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Project Wing partners with Virginia Tech to test delivery by unmanned aircraft September 8, 2016

Project Wing will be conducting research flights with Virginia Tech's Mid-Atlantic Aviation Partnership to explore food delivery by unmanned aerial vehicles. They will gather data on these operations to share with the Federal Aviation Administration as a step towards safely integrating deliveries by unmanned aircraft into everyday life.

The Virginia Tech Mid-Atlantic Aviation Partnership and X's Project Wing will conduct research flights this fall at Virginia Tech, delivering food using unmanned aerial vehicles. Project Wing is part of X, an innovation lab formerly known as Google[x] that incubates new breakthroughs in science or technology. The flights will be Project Wing's first tests involving external users in the U.S., and is its first collaboration with a Federal Aviation Administration-approved unmanned aircraft test site.

The current phase of research is taking place at a closed site with a small group of students and employees, and is not open to the public. The research, a step toward integrating deliveries by unmanned aircraft into everyday life, is a part of Virginia Tech's commitment to create intelligent infrastructure for human centered communities, a \$75 million initiative to provide experiential learning opportunities for students and build infrastructure that supports sustainable communities and co-evolves with users. This round of testing will explore food delivery, which has constraints such as time, temperature, frequency, packaging, and volume that make it an ideal research platform.

<https://vtnews.vt.edu/articles/2016/09/ictas-maaprojectwing.html#.V9KrZlzD-cw.email>

Alphabet To Test Use Of UAVs To Deliver Chipotle On College Campus.

[Bloomberg News](#) (9/8) reports that the FAA has approved a joint venture between Alphabet's Project Wing, Chipotle Mexican Grill, and Virginia Tech to conduct UAV delivery tests on the university's campus. Beginning this month, Project Wing "will use self-guided hybrids that can fly like a plane or hover like a helicopter" to "make deliveries from a Chipotle food truck to assess the accuracy of navigation systems and how people respond."

General Atomics Completes Integration Of Certifiable Predator B UAV.

[IHS Jane's 360](#) (9/8) reports that General Atomics Aeronautical Systems (GA-ASI) has completed integration of its Certifiable Predator B (CPB) UAV and is preparing the aircraft for further testing. GA-ASI President David Alexander said, "The completion of aircraft integration for the CPB aircraft is an important step in our progression toward building a certifiable system. ... CPB is a key product in our effort to introduce [UAVs] into non-segregated civilian airspace."

NYC Fire Department To Use UAVs In Emergency Response Efforts.

The [New York Times](#) (9/8, Subscription Publication) reports that the New York City Fire Department, in the coming weeks, will begin deploying UAVs to the scenes of “major fires and emergencies” to deliver “high-definition images in real time to commanders as they decide how to respond,” according to fire officials. In order to work around federally restricted airspace in the city, the fire department has worked with the FAA to come up with an agreement that requires the department “to get clearance before sending up a drone,” which should only “take about 15 minutes.”

Tanzania To Use UAVs For Mapping Project To Address Farmer-Herder Conflicts.

[Reuters](#) (9/8) reports that the government of Tanzania will deploy UAVs for mapping rural areas “in a bid to halt frequent and sometimes deadly clashes between farmers and cattle herders over land and scarce water resources.” This past February, farmers in Tanzania’s Morogoro region “killed hundreds of cows, sheep and goats...accusing their owners of letting the animals trample on their crops.” A “lack of officially demarcated boundaries” is one factor contributing to the conflict. A government official said, “The use of drones will help us to define the boundaries of plots of land on the ground with great accuracy.” More than 300,000 title deeds are expected to be issued in eastern Morogoro through the UAV-assisted mapping project.