

1. Introduction - Drones & UAVs – Good, Bad, or ????

2. Drones & Unmanned Aerial Vehicles

An **unmanned (uncrewed) aerial vehicle (UAV)**, commonly known as a **drone**, is an [aircraft](#) without a human [pilot](#) on board. UAVs are a component of an [unmanned aircraft system \(UAS\)](#); which include a UAV, a ground-based controller, and a system of communications between the two. The flight of UAVs may operate with various degrees of [autonomy](#): either under remote control by a human operator or autonomously by onboard computers. Compared to manned aircraft, UAVs were originally used for missions too "dull, dirty or dangerous"- for humans. While they originated mostly in military applications, their use is rapidly expanding to commercial, scientific, recreational, [agricultural](#), and other applications, such as policing, peacekeeping, and surveillance, [product deliveries](#), [aerial photography](#), smuggling, and [drone racing](#). Civilian UAVs now vastly outnumber military UAVs, with estimates of over a million sold by 2015. Certainly many more have been sold since.

3. FAA Awards Oklahoma State University Cert. To Fly Swarm Of UAVs

[UAS Magazine](#) (3/28) reports that Oklahoma State University's Unmanned Systems Research Institute (USRI) in Stillwater, Oklahoma, "recently received a certificate of authorization" from the FAA to "permit flights of a fixed-wing aircraft swarm within the national airspace, making it the first in the country to receive this authorization." This flight authorization will "permit a single pilot, along with visual observers for safety considerations, to operate a swarm of up to 20 fixed-wing aircraft." This unique configuration "developed by OSU researchers creates a 'swarm of swarms' where groups of unmanned aircraft fly within smaller flocks as part of a larger swarm, communicating with a local group leader which then coordinates flights with the overall swarm formation." This research "will advance unmanned aircraft capabilities into safe operation of autonomous vehicles within the national airspace" and will aid "ongoing OSU research in weather, environmental and infrastructure monitoring, agriculture, security, and airspace operations."

4. USAF Research Lab Looks For Skyborg Prototype UAV

[UAS Magazine](#) (3/28) reports that Oklahoma State University's Unmanned Systems Research Institute (USRI) in Stillwater, Oklahoma, "recently received a certificate of authorization" from the FAA to "permit flights of a fixed-wing aircraft swarm within the national

airspace, making it the first in the country to receive this authorization.” This flight authorization will “permit a single pilot, along with visual observers for safety considerations, to operate a swarm of up to 20 fixed-wing aircraft.” This unique configuration “developed by OSU researchers creates a ‘swarm of swarms’ where groups of unmanned aircraft fly within smaller flocks as part of a larger swarm, communicating with a local group leader which then coordinates flights with the overall swarm formation.” This research “will advance unmanned aircraft capabilities into safe operation of autonomous vehicles within the national airspace” and will aid “ongoing OSU research in weather, environmental and infrastructure monitoring, agriculture, security, and airspace operations.”

5. Northrop Grumman To Deliver Triton UAVs To RAAF In 2023

Defense News (2/27) reports that the Royal Australian Air Force “has allocated AU\$1.4 billion (U.S. \$1 billion) for the acquisition of” six Northrop Grumman MQ-4C Triton maritime surveillance UAVs and their ground control systems, with the first to be delivered in 2023. On Tuesday, RAAF Group Capt. Jason Lind also “said Australia has entered into a cooperative development program with the U.S. Navy to further develop the Triton,” embedding eight personnel in the U.S. program office. In total, the program is expected to cost “between AU\$3 billion and AU\$4 billion,” and an acquisition decision for a “seventh aircraft will be made at a later date.”

6. Boeing Unveils Unmanned Combat Jet Developed In Australia

[Reuters](#) (2/26) reports that The Boeing Company unveiled a prototype fighter-like jet “developed in Australia and designed to fly alongside crewed aircraft in combat for a fraction of the cost.” The multi-role, uncrewed aircraft “is Australia’s first domestically developed combat aircraft since World War II.” Boeing did not specify a dollar amount for the jet, but it is the company’s “biggest investment in unmanned systems outside the United States.” Boeing Autonomous Systems Vice President Kristin Robertson said, “It is a very disruptive price point. Fighter-like capability at a fraction of the cost.”

7. FAA Issues Waiver To State Farm To Fly BVLOS UAVs

Aviation Week (2/22) reports that insurance firm State Farm “has received a long-term FAA waiver” to operate UAVs “beyond the operator’s visual line of sight (BVLOS) and over people, activities the agency currently restricts.” The company plans to fly UAVs “for damage-assessment flights after natural disasters through November 2022.”

8. Drone crashes into Seattle's Space Needle

Dramatic footage captured on New Year's Eve 2016 in Seattle shows a drone circling the

Space Needle before eventually crash landing into the top of the iconic structure. No one was hurt. It's curious that its flight was quite benign until near the end when it seems to have been crashed into the SN. The operator occasionally adjusted the camera's view to keep the SN in frame.

A 20-year-old Pasco man has been charged with reckless endangerment for allegedly crashing a drone into the Space Needle's roof while pyrotechnicians were prepping for the annual fireworks display on New Year's Eve, the Seattle City Attorney's Office said Wednesday. Cole Kelley was piloting the drone when it hit the Space Needle, the city attorney's office said in a news release. Reckless endangerment is a gross misdemeanor and is punishable by up to 364 days in jail and up to a \$5,000 fine.

The crash was captured in a video by the drone's recording device, but didn't damage the Needle, Space Needle. According to information provided by the drone's manufacturer to the police, the drone weighs almost 7 pounds and can fly almost 50 mph. About a half-dozen pyrotechnicians were on the roof when the crash occurred around 2 p.m.

9. North Dakota House Endorses Privacy Legislation Aimed At UAVs

The [Houston Chronicle](#) (2/19) reports that "North Dakota's House has endorsed a measure that would impose penalties for using drones to invade someone's privacy." On Tuesday, state representatives approved the bill by a vote of 49-44. The bill would make using a UAV "to spy on or record someone in a private place, including through a window," a class B misdemeanor "punishable by up to 30 days in jail and a fine of up to \$1,500." The measure heads to the North Dakota Senate for consideration.

10. FAA To Publish Interim Final Rule On UAV Unique Identifiers

[Aviation Today](#) (2/21) reports that the FAA "is proposing a final rule requiring that small" UAVs display a "unique identifier." The move bypasses "the normal notice and comment period of up to 180 days," and the interim final rule "will take effect Feb. 25." According to a February 13 Federal Register notice, "Small unmanned aircraft owners are no longer permitted to enclose the FAA-issued registration number in a compartment." Public comments on the rule will be due by March 19.

[Seattle Times article](#)

11. FAA To Debut UAS Remote ID Rule In July.

[Aviation Today](#) (5/10) reported that the FAA "plans to release its remote identification ruling for UAS in July, UAS Integration Office Executive Director Jay Merkle said in front of Congress Wednesday." In remarks at a Senate Commerce Committee hearing on the addition of UAS identification to the National Airspace System, Merkle said that remote IDs "would allow the

FAA, police officers and other public officials to look up a UAS by a broadcast unique identifier and find out information about the operator.” Added Merkle, “We are working currently to ensure that we keep the policy component along with standards and remote id infrastructure all developed and harmonized.”

12.Deseret UAS, Nevada Institute For Autonomous Systems Awarded FAA, NASA Programs

[Directions Magazine](#) (2/19) reports that it was recently disclosed by NASA “that Deseret UAS and its partner, the Nevada Institute for Autonomous Systems (NIAS) have been awarded the Unmanned Aircraft Systems (UAS) Traffic Management (UTM) Technical Capabilities Level (TLC) 4 program.” Deseret UAS and NIAS, via the program, “will demonstrate the capability to safely fly multiple Unmanned Aerial Vehicles (UAV) (i.e.- drones) in an urban environment.” Furthermore, Transportation Secretary Elaine Chao “announced that Deseret UAS and NIAS have also been awarded the USDOT/Federal Aviation Administration (FAA) UAS UTM Pilot Program (UPP),” which “is a milestone pilot program to safely integrate drones into the National Airspace System (NAS) while creating a shared information network that can be used for future federal rule-making.”

13.Bill Increasing Penalty For Flying UAS Over “Critical Infrastructure” Facilities Advances In Tennessee

The [Kingsport \(TN\) Times-News](#) (2/19) reports that on Tuesday, Tennessee’s Senate Judiciary Committee advanced a bill that “would increase the penalty for flying a drone over a ‘critical infrastructure facility’ without the business operator’s consent from a misdemeanor to a felony.” The bill “appears to have been written for Kingsport-based Eastman and other Tennessee companies concerned about unmanned aircraft hovering over their facilities.” UAS are “increasingly coming to the attention of state policymakers who are attempting to strike a balance between public safety and commercial use, according to the National Conference of State Legislatures.”

14.FAA Increasing UAV Flight Restrictions Over Certain Federal Facilities

[GPS World](#) (2/19) reports that the FAA has produced more UAV “flight restrictions over US federal prisons, military bases and Pearl Harbor, effective Feb. 26.” The agency, in accordance with “the request of its federal security partners,” is utilizing “its existing authority under Title 14 of the Code of Federal Regulations (14 CFR) § 99.7 – ‘Special Security Instructions’ – to address concerns about drone operations over national security sensitive facilities by establishing temporary unmanned aircraft system (UAS) specific flight

restrictions.” The FAA, working with the DOD and the Department of Justice, is creating “additional restrictions on drone flights up to 400 feet within the lateral boundaries of” facilities which GPS World lists.

15. Scientists Solve Mystery Of Aurora-Like STEVE Lights.

[NBC News](#) (5/6) reports that “scientists finally have an explanation for the” Strong Thermal Emission Velocity Enhancement (STEVE) celestial phenomenon that “looks and behaves a lot like an aurora but has key differences.” New research published in the American Geophysical Union “suggests that the picket-fence aspect of STEVE” with “green columns of light passing” through a ribbon of pink light “is caused by a similar mechanism as the process that results in an aurora.” The study team “said the new results will help them learn how to predict the paths of particles flowing through the ionosphere.”

16. Britain Bans UAVs Within 5-Kilometer Zone Around Runways

[Bloomberg](#) (2/20) reports that, effective March 13, “a 5 kilometer (3.1 mile) drone exclusion zone” is being implemented by Britain “around its runways as the government responds to illegal incursions that closed London Gatwick airport for 36 hours in December, disrupting travel for more than 120,000 people.” In a statement on Wednesday, the Department of Transport said that the rules will broaden the current 1-kilometer no-fly zone that applies to model and unmanned aircraft. In the release, Transport Secretary Chris Grayling said, “The law is clear that flying a drone near an airport is a serious criminal act. ... We’re now going even further and extending the no-fly zone to help keep our airports secure.”

17. Flights At Dubai Airport Halted After Suspected UAV Sighting

The [New York Times](#) (2/15) reported that Dubai International Airport “was forced to briefly shut down departing flights on Friday because of what it said was ‘suspected drone activity.’” Dubai airport “said in a statement that flight departures were suspended between 10:13 a.m. and 10:45 a.m. because of concerns about drone activity.” The [Wall Street Journal](#) (2/15, Subscription Publication) reported that an unnamed Dubai official indicated that a lone UAV operator in the desert caused the shutdown. It was undetermined whether any UAV operator had been apprehended.

18. Loganair Flight In “Near Miss” With UAV

[BBC News Online \(UK\)](#) (2/15) reported that the UK Airprox Board (UKAB) has issued a report on a UAV that nearly struck a November 24, 2018 Loganair flight near Glasgow airport. The UAV flew about 15 feet from the SAAB 2000 captain’s window. The report indicated that the UAV had been endangering aircraft in the area in general. The UKAB categorized “the risk of

collision as category A, the highest possible risk rating.” Loganair COO Maurice Boyle said, “Fortunately there was no collision, but this was potentially a very serious incident.”

19. Collins Unveils Piccolo Elite Autopilot For UAS.

[Aviation Week](#) (5/8) reports that at the Association for Unmanned Vehicle Systems International conference, Collins Aerospace “unveiled an upgraded, open-architecture autopilot system for unmanned aircraft systems,” Piccolo Elite Autopilot.

20.FAA Updates UAS Detection Guidance For Airports.

[Aviation Week](#) (5/8) reports that in materials dated May 7, the FAA “cannot confirm the legality’ of using technologies designed to detect small unmanned aircraft systems (UAS), the agency states.” The FAA provided “information to airport operators interested in testing systems that can detect and track drones flying within the vicinity of an airport and so-called counter-UAS (C-UAS) systems capable of disabling” and “taking control of” UAS.

[Reuters](#) (5/8) reports that the FAA warned airports that they cannot install UAS countermeasures without the permission of the FAA, because such systems could interfere with existing aviation systems. The FAA assured airports, “There are many related efforts that are underway that will make it easier to identify drone operators.” The FAA said that measures by Congress to permit law enforcement destruction of UAS does not “provide authority to deploy and use (drone countermeasures) as a standing asset to protect airports.” However, the FAA said that federal agencies are looking into how to address “persistent serious [UAS] disruption of operations at an airport.” Two senators “urged Transportation Secretary Elaine Chao to finalize a long-delayed rule to require the remote identification of drones,” a task which Congress had assigned to the FAA in 2016.

21.FAA: Miami Police Department’s Use Of Counter-UAS Company During Music Festival May Have Broken Federal Law.

[WSVN-TV](#) Miami-Dade, FL (5/8) reports that “with the Ultra Music Festival announcing its move out of Miami next year...the feds are concerned about something that happened overhead during this year’s event.” Although the first year of Ultra Music Festival on Virginia Key “had its share of major hiccups,” including a “transportation fiasco” and a “brush fire,” there were also “problems in the air.” The FAA is “investigating after, they say, Miami Police hired a company to keep drones out of the area.” The FAA “said [counter-UAS] may have broken the law by jamming drone signals.” In a statement, the FAA said that they “looked into a report that the Miami Police Department (MPD) hired a company to provide counter-drone services during a recent music festival in Key Biscayne.” The FAA added, “MPD stopped the operations after the FAA advised the department that the use of counter-drone technologies

may create possible conflicts with federal law.”

22.UAV Pilot Charged With Violating Secure Airspace Over Two NFL Games

[NBC News](#) (5/16) reports that federal prosecutors on Tuesday “charged a drone pilot with violating airspace regulations in connection with anti-media flyers that were dropped over two Northern California sports stadiums” during two “National Football League games on Nov. 26, 2017.”

23.Homeland Security Increasingly Concerned About Dangers Of UAVs.

[NBC News](#) (5/3) reported that the Department of Homeland Security (DHS) “is beefing up its anti-drone efforts away from the country’s borders as it takes aim at potential national security threats.” DHS Program Manager Tim Bennett, a counter-UAV expert who works in airborne technology at DHS in the Science & Technology Directorate, said, “One of the biggest problems is that we don’t have a true understanding of the complete air picture” and precisely how many UAVs are in US airspace, “and that’s what we are now just starting to get into.”

24.North Dakota “Drone Corridor” Receives \$33M In State Funding.

[Aviation Week](#) (5/6) reports that “the North Dakota Commerce Department will invest \$33 million to help develop the state’s infrastructure for flying unmanned aircraft systems (UAS) beyond visual line of sight (BVLOS) of ground operators, Gov. Doug Burgum (R-N.D.) announced.” The University of North Dakota, Harris Corporation, and the Grand Sky Business and Aviation Park will partner with the state government in “developing a 100-mile-long” UAS corridor.

25.FAA Awards Oklahoma State U. Certification To Fly Swarm Of UAVs.

[UAS Magazine](#) (3/28) reports that Oklahoma State University’s Unmanned Systems Research Institute (USRI) in Stillwater, Oklahoma, “recently received a certificate of authorization” from the FAA to “permit flights of a fixed-wing aircraft swarm within the national airspace, making it the first in the country to receive this authorization.” This flight authorization will “permit a single pilot, along with visual observers for safety considerations, to operate a swarm of up to 20 fixed-wing aircraft.” This unique configuration “developed by OSU researchers creates a ‘swarm of swarms’ where groups of unmanned aircraft fly within

smaller flocks as part of a larger swarm, communicating with a local group leader which then coordinates flights with the overall swarm formation.” This research “will advance unmanned aircraft capabilities into safe operation of autonomous vehicles within the national airspace” and will aid “ongoing OSU research in weather, environmental and infrastructure monitoring, agriculture, security, and airspace operations.”

26. Defense Researchers Study Using UAS Swarms To Assist Search And Rescue.

[Airforce Technology](#) (5/8) reports that the U.S. Air Force Research Laboratory (AFRL) “has kickstarted the first-of-its-kind ‘hackathon’ project” to study “how organisations can plan complex UAS search and rescue missions, assisting emergency services that have finite resources in terms of manpower, equipment and funding.” The “Swarm and Search AI Challenge: 2019 Fire Hack” project is being conducted “in collaboration with the UK’s Defence Science and Technology Laboratory (DSTL).” Congress “is also set to pass the Wildfire Management Technology Management Act” in the next few months, a bill “that is likely to expand the use of drones to track wildfires and monitor firefighters using GPS to increase safety.”

27. Raleigh’s WakeMed Hospital Launches UAV Delivery Program For Campus Medical Sample Deliveries.

[CBS News](#) (5/7) reports that a hospital in Raleigh, North Carolina, is “pioneering the use of drones to speed up the delivery of critical medical samples across WakeMed Hospital’s campus.” WakeMed “partnered with...UPS and drone-maker Matternet to launch the program in March.” The program debuts the “first revenue-producing commercial drone flights approved by the FAA,” and it is “the brainchild of Dr. Stuart Ginn, a former United Airlines pilot,” who “believes these drones will soon fly between hospitals miles apart and one day become a link to remote rural hospitals.” The three-year test pilot program will “test the integration of drones into the commercial airspace in Raleigh.” UPS, however, “thinks in the years to come, the program can be expanded to other hospital systems across the country.”

28. Zipline Drones can Deliver Medicine Faster.

The [Zipline](#) company's drones are designed and built in-house. A drone weighs approximately 10 kilograms (22 lb), carries a payload of up to 1.5 kilograms (3.3 lb). Drones can deliver medical supplies to 80 km (50 mi) in 45 minutes. Medical staff at a clinic send an order via SMS, WhatsApp message or zipl; a dedicated Zipline website and a confirmation message is returned. Flight paths are selected and programmed using information from a 3-D satellite map and manual ground surveys. A technician at the base monitors the flight. The

location data is also sent to the country's main air traffic control system to coordinate with commercial airliners. The drones launch by supercapacitor-powered electric catapult, and return by an arresting gear. The drone does not land at the delivery site but drops to a low height and drops the package to the ground slowed by a parachute-like air brake. An inertial navigation system allows the drones to land a payload within a landing zone 5 m (16 ft) in diameter. In Rwanda, the company began drone deliveries in late 2016, and primarily delivers blood to urgent medical situations.[9] In addition to whole blood, the drones deliver platelets, fresh frozen plasma, and cryoprecipitate.[10] As of May 2019, more than 65% of blood deliveries in Rwanda outside of the capital city Kigali use Zipline drones.

29.FAA Predicts Explosion In Commercial UAS Industry In Coming Years.

[NextGov](#) (5/3) reported that the FAA has released a report highlighting how much faster the number of UAS in the US has grown compared with what the agency predicted last year. In the past year “alone, commercial drone operators registered more than 175,000 new aircraft with the FAA, increasing the total number of commercial drones in use across the U.S. by more than 170 percent, according to the administration’s annual aerospace forecast.” The increase in registrations “expanded the commercial drone market to 277,000 units,” and it “far exceed[ed]’ the 44 percent growth officials predicted at the beginning of the year.”

[Point of Beginning](#) (5/3) reported that the “FAA projects the small model UAS fleet to grow from 1.2 million vehicles in 2018 to 1.4 million in 2023, an average annual growth rate of 2.2 percent.”

30.Pentagon Testing Open-Source Software On UAVs.

[Defense One](#) (5/3) reported that the Defense Innovation Unit recently unveiled a “\$2 million deal with the Swiss-based startup Auterion to enhance its open source drone software.” The PX4 platform “would standardize the operating system for different drone models,” and it “could one day power the Army’s entire fleet of small unmanned aircraft.” Demand for Auterion’s PX4 platform “reflects the wider tech community’s shift toward open source software – Microsoft in October finished its \$7.5 billion acquisition of Github, the world’s most popular open source development platform, and IBM is currently in the middle of a record-setting \$34 billion merger with the open source cybersecurity firm Red Hat.” Here an open source drone that you can build.

31.Concluding Comments on Drones & UAVs.