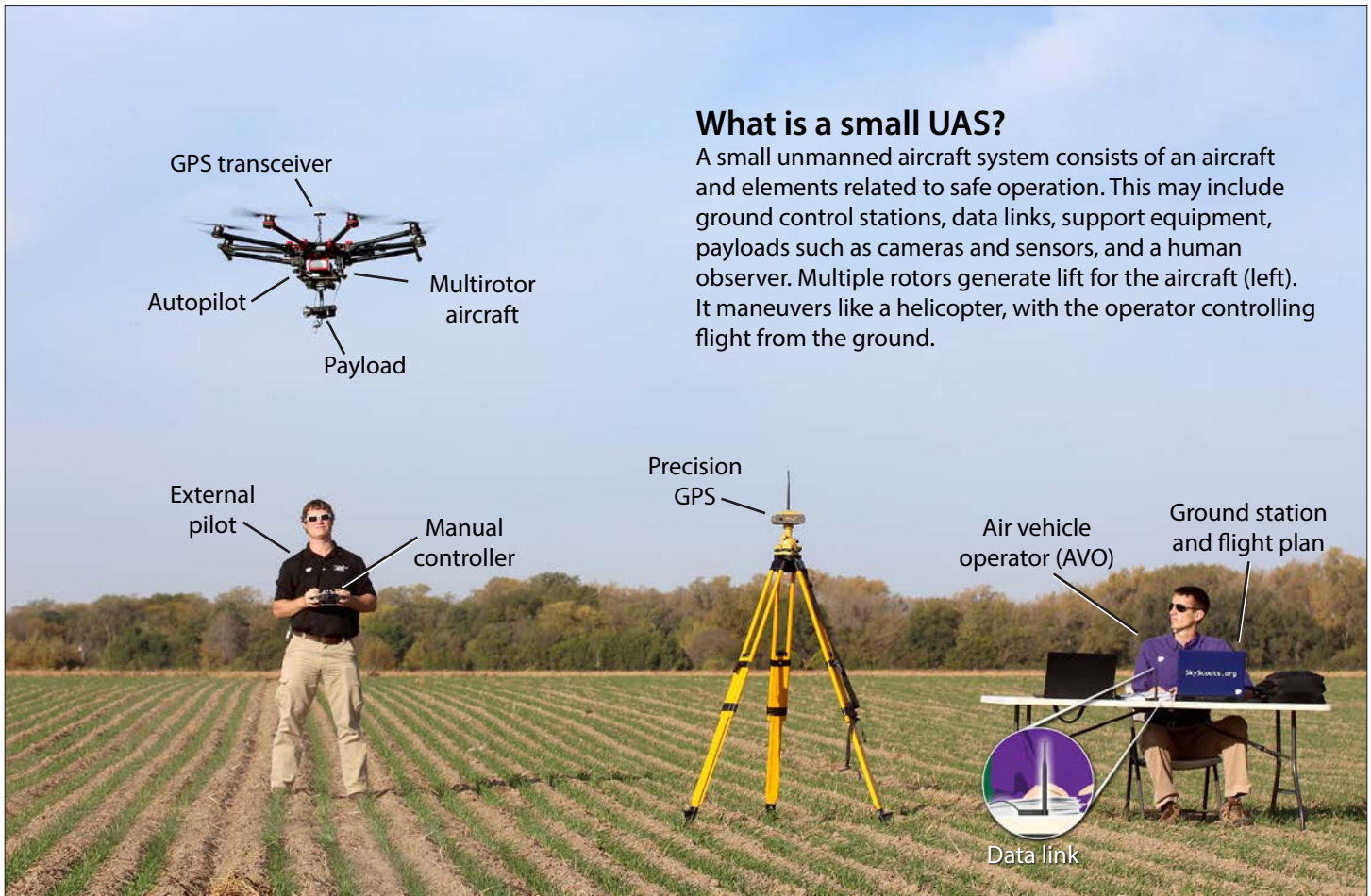


What You Should Know About Small Unmanned Aircraft Systems (UAS)



What is a small UAS?

A small unmanned aircraft system consists of an aircraft and elements related to safe operation. This may include ground control stations, data links, support equipment, payloads such as cameras and sensors, and a human observer. Multiple rotors generate lift for the aircraft (left). It maneuvers like a helicopter, with the operator controlling flight from the ground.

Small, unmanned aircraft systems (UAS), also known as drones, are fixed-wing or rotary-wing vehicles that do not carry humans on board. The term sUAS applies to unmanned aircraft weighing less than 55 pounds. The smallest vehicles weigh less than a pound and fit into the palm of your hand. Small, electric-powered versions can fly for 15 to 25 minutes. Larger, gas-powered models fly up to 24 hours.

Safety Regulations

Interest in recreational and commercial use of small UAS has grown with advances in technology and the development of nonmilitary applications. The increasing number of small, unmanned aircraft operating in the public airspace led the Federal

Aviation Administration (FAA) to issue a rule that provides specific safety regulations for nonrecreational use. Those who fly for commercial reasons must follow these regulations. Guidelines pertaining to specific types of users can be found on page 4.

Rules are subject to change. Make sure you are in compliance before operating a small unmanned aircraft system. Learn more at <http://knowbeforeyoufly.org>.

Applications

Practical advantages of small UAS for food production, transportation, public and environmental safety are described on the following pages.



Small UAS at Work

Examples of how small UAS benefit those working in agriculture, energy, transportation, and safety.



The rigid wing and streamlined shape (airfoil) lift the aircraft as it accelerates. A single propeller driven by an internal combustion engine or electric motor produces forward thrust and enough airspeed to keep the payload aloft.



Food Production

Sensors allow farmers and ranchers to monitor plant health and detect problems with rangeland and livestock long before they are visible to the unaided eye. They can be equipped to estimate crop yield, collect precision agriculture prescription data, and track livestock migration. The thermal image, left, shows animal location.



Crop Protection and Plant Biosecurity

Early detection of pests and invasive species and implementation of sophisticated pest management strategies are possible with remote-sensing technology. Using small UAS to create vegetation maps, researchers can chart field patterns to identify and manage damaging infestations of crop pests.



Infrastructure Inspection

Small unmanned aircraft systems permit evaluation of hard-to-reach structures such as wind turbines, power lines, and smokestacks without endangering inspectors. The ability to relay information in real time at a lower cost, increases the economic efficiency of the power system.



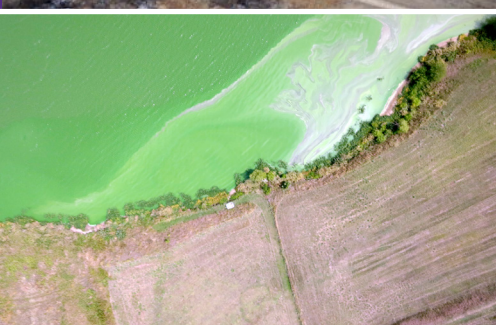
Transportation

The ability to capture images tagged with the time and location increases the utility of small UAS for road and bridge inspection, pothole detection, accident reporting, environmental assessment, and post-disaster surveys.



Public Safety

The aerial view provides an advantage for emergency responders who must locate victims quickly in wilderness or large urban areas. Site details help search and rescue teams make better decisions, saving lives and protecting property.



Water Quality

Small UAS are used to monitor shorelines, swimming beaches, and farm ponds for algae that may be harmful to humans and livestock. Routine checks enable rapid response to changing environmental conditions.

The table below lists Federal Aviation Administration (FAA) restrictions at the date of publication. For the latest rules, visit the FAA online: www.faa.gov/uas.

Guidelines for use of small UAS in Federal airspace

	Hobbyist UAS Flights	Commercial Part 107 UAS Flights
Pilot requirements	None	Must have Remote Pilot in Command (RPIC) certificate Must be age 16 or older Must be vetted by the Transportation Safety Administration (TSA)
Aircraft requirements	Must weigh less than 55 lbs	Must weigh less than 55 lbs Must be registered Must undergo pre-flight check to ensure UAS is in an airworthy condition
Location requirements	5 miles from airports unless air traffic authorization is obtained	Class G Airspace
Operating rules	Must yield right-of-way to manned aircraft Must fly less than 400 above the ground Must keep aircraft in visual line of sight Must follow local laws	Must yield right-of-way to manned aircraft Must fly under 400 feet Must fly during the day Must fly at or below 100 mph Must not fly over people Must not fly from a moving vehicle
Example applications	Recreational flying with no compensation	Aerial survey Cinematography Flight incidental to a business Roof inspections Real estate purposes
Legal reference	Public Law 112-95, Section 336 – Special Rule for Model Aircraft	Title 14 of the Code of Federal Regulations (14 CFR) Part 107

14 CFR Part 107

This regulation requires commercial UAS operators to obtain a remote pilot in command (RPIC) certificate. Pilots who hold a Part 61 license must complete the FAA online training course, which can be found at www.faa.gov/uas.

Those who are not licensed pilots must pass the written exam (Part 107 sUAS Commercial Pilot Training) at an FAA-approved testing facility. Kansas State University Polytechnic Campus in Salina is one of the few testing sites in the state. The school also offers a five-day test preparation course, which is recommended. Learn more about pilot certification and testing at <http://polytechnic.k-state.edu/profed/>.

Section 333 Exemption

A Section 333 exemption allows a sUAS operator with an FAA airworthiness certificate and COA to fly in approved airspace and is required for commercial use. Other operators can apply for the exemption

online at the FAA Section 333 page. A previously obtained Section 333 exemption is valid through the expiration date on the document. Learn more at https://www.faa.gov/uas/beyond_the_basics/section_333/.

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