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Drones: Eye In The Sky

As tomorrow's technology matures into today's staple tool, we look at the latest models for the photographer and videographer

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In 2016, it was reported that over 2.5 million drones were sold in the United States alone, and the Federal Aviation Administration (FAA) is projecting that figure to exceed 7 million units in 2020. If you've ever flown a drone before, you can appreciate the thrill of instantly getting a bird's-eye view of where you're standing. Advancements in unmanned aerial systems (UAS) have also brought about an unprecedented amount of creative opportunities.

Long gone are the days of having to rent a helicopter to get a particular aerial view. Now, you just need to grab that drone and you're off. But before you take to the sky and earn your wings, you need to be aware of the very real risks of flying a drone and what you need to do to ensure a safe—and legal—outing. As a disclaimer, it's your responsibility to research and abide by the respective laws pertaining to drone flight for your country, state, city and/or municipality.

Choosing A Drone

Before diving into the oft-murky rules and regulations surrounding drones, let's take a look at some of the current options available to photographers and videographers. Regardless of the drone, there are certain common factors that we look at when determining performance. As photo/video creators, the quality of the onboard camera and sensor plays a massive role here, as do variables such as battery life and operating distance. Finally, there's the form factor of the drone. How heavy is it? Can it be packed in a camera bag easily? Fortunately, the drone market has matured enough that you can find a solution to fit most anyone's needs and budget.

Drones provide photographers and videographers with a perspective on the world that even recently would have been difficult to attain, and the results can be stunning—especially with the right model drone.

While there's a healthy number of drone manufacturers, DJI, GoPro, Parrot and Yuneec are the most well-known in the photo and video space.

For The Serious Hobbyist, Weekend Shooter And Advanced Amateur

Arguably, one of the most popular drones on the market today is the DJI Mavic Pro, as it represents a marriage of high-end image-quality capabilities—4K video recording at 30 fps, 12-megapixel sensor and respectable manual exposure controls—with a svelte form factor, allowing it to be packed in virtually any type of messenger or backpack. With its wings folded in, the Mavic Pro is about the same size as a liter soda bottle and weighs just over 1.5 pounds.

DJI Inspire 2

Like many of DJI's recent drone offerings, the $1,000 Mavic Pro comes preprogrammed with several interesting flight modes, including ActiveTrack, where the drone will automatically track and follow an object; Tripod Mode, which strongly limits the max speed and control sensitivity of the drone in exchange for increased stability during exposure; and Terrain Follow mode, which lets you simply send your drone forward while it automatically adjusts altitude to compensate for the rises and dips of the land below.

Finally, the Return to Home feature has been a godsend on several of my outings. With a single button press, my Mavic Pro will safely return back to the exact location it took off from, thanks to its use of GPS and GLONASS, coupled with forward and downward proximity sensors.

Another popular intro drone is the Parrot Bebop 2 Drone at $500. The video isn't as high quality as the Mavic, but it does have a 14-megapixel camera and comes at a cheaper price. The Bebop 2 is available in a kit with a VR-style headset that allows you to view the feed from the drone's camera.

The Yuneec Typhoon Q500 4K Quadcopter ($700) has a similar feature set and can capture 4K video at 30 fps and 1080p at 120 fps. The controller has a built-in screen, and the camera can be removed and connected to an accessory grip for use on the ground.

There's also the GoPro Karma ($800), which is essentially a flying platform for the company's existing GoPro action cameras. The compact Karma fits easily into a backpack, and the image-stabilizing gimbal on the Karma that holds the GoPro can be removed and used with an accessory grip as a stabilized action camera.

For The Seasoned Pro

One inescapable limitation of the more entry-level drones, though, is the onboard camera sensor. In the right lighting and weather conditions, images can be bright and sharp, but once you dip into more unfavorable situations, photo and video quality falloff is quick.

While most drones on the market are consumer toys, the best-known brands staked their claim in the drone space, with models designed for active photographic and video use thanks to the use of better sensors and better lenses.

Hallmarks of this category are larger-sized, higher-resolution sensors that can capture 4K video and images with high dynamic range, controllers with a host of built-in automated features, and a stabilization and control package that makes flying almost effortless, even at his speeds and in high winds.

The DJI Phantom line is the company's most popular drone line, and arguably the most popular drone in this class. The new Phantom 4 Pro and Phantom 4 Advanced pack a better camera and more features onto the proven Phantom platform. The Phantom 4 has a 1" 20-megapixel CMOS sensor, obstacle avoidance and a distance of up to four miles in a compact and durable chassis. The intuitive software allows for subject tracking, flight plans based on tapping on a Google-like map and auto-adjusting altitude.

Its battery is rated for 30 minutes of flying time on a full charge, it uses an array of vision sensors providing four-direction obstacle avoidance, and it supports an optional 5.5" display (with the Phantom 4 Pro+), removing the need to use a smartphone or tablet for flight operations.

What should make the Phantom 4 Pro so appealing to professional photographers and cinematographers is the strength of its camera sensor and inclusion of a mechanical shutter. The latter is especially important in reducing the rolling shutter effect commonly found in other drones. It's also priced $499 higher than the Mavic Pro, with the Phantom 4 Pro at $1,500 and the Phantom 4 Pro+ with display for $1,800.

For The Commercial-Grade Shooter

At the next higher level, the DJI Inspire 2 packs all of the flight and flight control features of the Phantom 4 into a body that comes equipped with either the company's X4S or X5S camera, which can be removed and swapped out with other drones with the same gimbal port. The X5S uses many Micro Four Thirds lenses, and both cameras can record 5.2K video to 30 fps or 4K video to 60 fps using CinemaDNG, Apple ProRes and other formats. The Inspire 2 uses a solid-state hard drive to record H.265 or H.264 video at 100 Mbps and capture still image bursts up to 20 fps. For the advanced shooter or beginning commercial-grade shooter it's a great choice, with a price under $5,500.

Sometimes, you just need to get your

DJI Phantom 4 Advanced

Yuneec Typhoon H

full-frame camera and super-fast lens up in the air, and consumer drones just won't cut it. That's where the DJI S1000+ comes in. With a maximum takeoff weight of just over 24 pounds, this drone can have most any full-frame mirrorless or DSLR camera mounted to it and have far superior exposure control and lens options. At $1,500, this system is basically a flying camera mount, but it's an affordable way to get your larger cameras aloft.

Another option, albeit for those with deep pockets, is the ALTA 8 by Freefly Systems. At roughly $18,500, this drone is for serious commercial applications where conditions are rough. The drone is weather resistant, and vibration isolation keeps the camera from encountering any vibration, even in rough skies.

Whereas consumer drones like the Mavic Pro and Phantom 4 Pro come fully assembled and ready for use out of the box, commercial drones like the S1000+ require you to acquire and install components such as the DJI Zenmuse gimbal, flight controller and GPS module, just to name a few. Still, if you need to get your camera up in the air, the DJI S1000+ can help.

The Laws Of The Land...Er...Air

Now that you have a better idea of some of the more popular drones available, you need to learn about the rules and restrictions currently put in place by federal, state and local governments in order to protect commercial airspace, as well as populated and private areas. For the purpose of this article, I'll be focusing on the laws pertaining to the United States; however, even these laws can change with little notice, so be sure to do the proper research for wherever you intend on flying.

As the popularity of consumer drones increased over the past several years, so did a proportionate amount of scrutiny around how to regulate them. On one hand, it makes sense to impose guidelines and rules related to where and when a person could fly a drone. In other situations, the need to clamp down on flying came about as the result of some very poor choices made by certain individuals who flew their drones in areas where common sense would clearly dictate not to.

If you intend on flying in the United States, one of the first websites you should visit is the FAA's UAS Getting Started page (www.faa.gov/uas/getting_started). Here, you'll find a helpful list of guidelines that any responsible drone operator should abide by. It's important to note that the FAA clearly differentiates between hobbyist flying ("Fly for Fun") and commercial flying ("Fly for Work"), and it's your responsibility to ensure appropriate certification, permitting and permission based on your intent.

The laws and rules around where you can fly drones seem to shift regularly. For example, in December 2015, the FAA widely announced that all owners of drones weighing more than 250 grams (all the drones mentioned in this article weigh more than 250 grams) must register themselves as a drone operator in a national database. Then, in May 2017, a ruling from the U.S. Court of Appeals struck down the FAA's requirement for registration of drones for anyone intending to use it for hobby or recreation. It's worth noting again that if you're flying a drone for commercial purposes, you do need to register your craft.

GoPro Karma

Another layer of complexity (in some cases) involves knowing specifically where you are and are not allowed to fly, referred to as No-Fly Zones. Some No-Fly Zones should be instantly obvious, such as around airports, whereas others require a deeper understanding of the current rules. For example, as of June 2014, it's illegal to fly your drone in any U.S. National Park per NPS Policy Memorandum 14-05. Fortunately, the FAA has released a free mobile app called "B4UFLY" that helps drone operators quickly determine whether their immediate surroundings are okay for flight.

Parrot Bebop 2

To pile onto the labyrinth of legal do's and don'ts, a number of states and localities have implemented their own laws related to drone operation. Fortunately, most of these laws focus on controlling the use of drones over public spaces and private properties where privacy is reasonably expected (like alongside someone's home). While the legal waters on consumer drone operation are murky, I find that you can easily avoid trouble by applying a healthy dose of common sense and caution around where and when you fly.

Despite the ever-shifting legal landscape, incorporating a drone into your photo or video creation process can offer truly breathtaking opportunities that could never be possible from the ground. DPP