

EAGLE EYE

WHAT TO LOOK FOR IN ON-BOARD CAMERAS

BY JOHN REID

Now that you have your drone and have mastered flying it, what's next? Logically, the next step for most people is to mount a camera on their drone. While this seems like it would be an easy thing to do, you will soon find there are several choices out there for camera equipment. Of course, your camera requirements will be different from those of your other multirotor pilot friends. But you still have to decide what type of photography you want to do. Do you want to also do video? What is the best equipment to accomplish that? Do you have the skills to control all the features on the camera or do you want a point and shoot?

While it seems like we have created a number of questions that need to be answered, we will explain the different types of cameras that are available and discuss the advantages and possible disadvantages of each. There are many different camera types that can work for your particular needs, but perhaps one of the biggest factors to consider is your budget. The bigger question than budget is how much money are you willing to put up in the air, and put at risk. The smaller multirotor aircraft will only allow smaller size cameras. Obviously, the larger the multirotor, the larger the payload can be. This allows for better-quality equipment that can be put up in the air. All of this adds up to more cost, which can be justified by how you plan on using the photos/videos. If all you want are photos and videos to put up on YouTube or Facebook, the smaller quadcopters and cameras will work just fine. However, if you are looking to put together a high-quality film, then you will need higher-quality equipment in the air to match your shooting style. Of course, these are questions that only you can answer, but we can give you some guidance on the equipment that is out there and what may fit your needs.

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VIDEO AND PHOTOGRAPHY

The first thing to look at is do you need photography or video or in some cases, both. If all you want to do is to take photos from an aerial perspective, then there is no need to look at cameras that include both video and photographic capabilities. Keep in mind that once you make the decision to either shoot all video or all photos, you're stuck with that, and the only way to change this is by purchasing another camera.

Fortunately, there are a number of small and larger body cameras that can shoot both video and photo, and they do them equally well. Some of the more common smaller body cameras that fit this bill include the GoPro (gopro.com), Ghost (driftinnovation.com), and Replay (replayxd.com) action cameras. These cameras are very compact, can take a lot of abuse, and deliver HD video and high-quality photography, but they do have their limitations. Higher-end camera bodies such as Canon and Nikon will require a larger drone to get them in the air but they will give high-quality photographs and outstanding video. However, these cameras do cost a bit more and are not as durable as the action cameras. But they do have the advantage of allowing you to shoot with different types of lenses and control all the creative features such as shutter speed and aperture.

LENS SELECTION

One of the beauties of DSLRs is that you can use different types of lenses and these lenses produce different views on the world. Many of the personal action cameras come with a wide-angle lens on the front, which gives a wide view of the world. This is great if you are only shooting landscape types of images. Some of the personal action cameras do offer less of a wide-angle view, which is great for air-to-air or close-up type shots of your ground subject. Cameras like the Drift Ghost offer fields of view that goes from 160° down to 90°. Aftermarket products are sold for the GoPro camera that also reduce the field of view down from the wide-angle lens that comes with the camera.

To really take advantage of lens selection, you have to step up to camera such as Nikon, Canon, Sony (sony.com), Panasonic (panasonic.com), or Blackmagic (blackmagicdesign.com) that have removable lenses. With these cameras you can change out for wide-angle to telephotos or even install a zoom lens that will allow you to move in and out while you're shooting. Cameras like these offer great versatility while in the air and shooting.



WI-FI

This is a feature that is nice to have because it will allow you to control the camera and see what the camera is shooting. Most systems will connect to your smartphone and allow you to use it as a mini monitor and control. However, many systems, at least right now, do have some lag time in getting the image to your smartphone or monitor. Of course, this will be improved with each new camera release. For photography, this slight lag in time would be just fine, but for video you may still want to rely on the first-person-view systems. For now, Wi-Fi is a great addition to any camera; if yours incorporates such a feature, take advantage of it and use it to your best advantage.



ALWAYS CHECK WITH YOUR CAMERA MANUFACTURER TO MAKE SURE THAT THE BODY AND LENS YOU SELECT A CHANCE WITHSTAND THE VIBRATION THAT IS PRODUCED BY THE MULTI-ROTOR

ACTION OR PROFESSIONAL CAMERAS

As to be expected, both sharpness and quality tend to go up as you pay more for the camera body. This is mainly due to the size of the digital chip or CMOS chip that takes in the light, creates the image, and transfers it to the storage drive. With that being said, you can expect to get some pretty good-quality video/photos from relatively inexpensive smaller cameras. Most of the GoPro/action cameras do produce HD video and very good-quality photographic images.

Again, the question comes up, "How are you going to use the videos/photos you are producing from your multirotor aircraft?" If you are producing personal things you want to show to friends and family, all you will ever need is a smaller multirotor and just about any type of compact camera. I have never heard of anyone complaining about the quality of images that they get from a GoPro type of camera. Now, if you want to step up and produce gallery-type photographic images and blockbuster films, you have to move up to a much-larger professional multi-rotor aircraft. Along with that, your camera body will have to get much larger, have removable lenses, and produce a higher-quality and sharper image.



With a two-man crew, the pilot can concentrate on flying the multirotor. The cameraman controls the camera gimbal while watching real-time images on the monitor.

CAMERA OPERATOR

If you are operating a smaller multirotor and working with a smaller action camera, you will most likely be doing the piloting and photography yourself. In many cases, the video will be continuously running or automatically taking photos every few seconds while you are flying. Most of your job will be setting up the multirotor in the direction you want to photograph and trying to estimate where your lens is pointing. This is one advantage of having wide-angle lenses on the smaller action cameras.

But if you really want to concentrate on the shot you will need a larger multirotor, more sophisticated camera, and a camera operator. With a two-man crew, one person is designated as the pilot of the multirotor, and the other operates the camera gimbal and controls the camera separately from the aircraft. Generally, the camera operator will use some form of first-person view (FPV) that is either linked or runs parallel to the camera lens. This allows the camera operator to see in real time exactly what the lens is photographing. The camera operator will control the camera through his own transmitter, which has the capability of moving the camera to any position and allow the operator to control basic camera functions such as focus, shutter speed, aperture, and the shutter button.



LIGHTWEIGHT

Weight will always be a concern when dealing with multirotors, they can lift heavier objects, but you will need a much larger multirotor to do it. This means there is a much larger investment in equipment and the flight time will be shorter. For this reason, the smaller action cameras are rather popular from most midsize multirotors. If you're looking to improve your image quality, there are a number of lightweight camera bodies out there produced by Canon, Sony and Panasonic. The EOS Rebel SL1 is a very lightweight camera body that produces outstanding photographs and full HD video. This body coupled with a lightweight lens can easily be attached to a midsize 500 to 600mm multirotor.



IF YOUR CAMERA IS EQUIPPED WITH MANUAL FOCUS, USE IT. SET IT TO JUST UNDER THE INFINITY MARK ON THE LENS. THAT SHOULD KEEP MOST THINGS SHARP IN THE IMAGE FROM THE AIR

CAMERA CONTROLS

The two main camera functions that are nice to have remote control on are the shutter for photography and start/stop button for video. Most upper-end camera bodies and some action cameras have a mini USB port that allows connection to control these functions. This enables the operator remote control of shutter and other functions. These would be almost a requirement if you were working with a rig that allows for a separate cameraperson.

If you want to just operate the multirotor as the pilot, you can set the camera to take photographs every 2 to 5 seconds. For videos, just turn it on before take off and let it run. Then, depending on the length of times for the shutter release, just hang the drone in the air for that duration of time pointing at your subject. I like to let at least two to three shots happen before moving to the next location. For photography, it's better to have a large DataCard and let the camera trigger every 1 to 2 seconds.



Final thoughts

Getting a camera up on the multirotor can be as easy or as complicated as you want to make it. However, it really doesn't matter if you have a cameraman and a heavy-duty rig with all the bells and whistles or just a simple quadcopter with the camera bolted on that's continuously shooting. The key thing is to get that camera in the air and discover your new view on the world from a bird's-eye perspective. ✈️