



## A GUIDE TO USING UNMANNED AERIAL VEHICLES IN FILM AND MEDIA PRODUCTION

We are now seeing more and more aerial shots in TV programs, films and even industrial training films. There is no doubt that a well-executed shot can add hugely to the viewer experience and give a lift to the production values of the entire film. The reason for the current interest in aerial photography is largely due to the availability of high-performance low-cost Unmanned Aerial Vehicles (UAVs). These technical marvels can lift a camera high in the air, provide the camera man with a live view of the footage, and chase, hoist, track and do all the other camera movements a director may ask for.

A number of technologies have come together to make this possible: efficient brushless electric motors, super high capacity lithium polymer batteries, and the silicon microchip gyros and GPS systems that keep the aircraft stable and safe. These aircraft are so smart that in the (rare) event of loss of radio signal, they use their own GPS navigation system to fly their way home and land at the pilot's feet.

As with all film equipment, you need to know how to get the most out of a UAV shot. These guidelines may help you to exploit this versatile new technology in the planning and execution of your next film,

Some legal basics first: All commercial UAV operators in the UK must be licensed by the Civil Aviation Authority (CAA), and are bound by standard operating regulations. This allows them to fly up to 400 feet above ground, and 500 metres from the operator. Other restrictions exist on flying near large crowds and members of the public. These terms can be extended only with the permission of the CAA. All reputable operators carry third party liability insurance. More than 90% of the UK landmass is in uncontrolled airspace, meaning that flights can be made without any formality, apart from getting the permission of the land-owner, of course! Sometimes the land-owner will demand a fee, and don't assume that using public land will be free of restrictive bye-laws.

Safety is paramount and the UAV operator will carefully consider the issues and risks for each shot and flight. The operator will advise if a particular desired flight profile carries unacceptable risks beyond the scope of the craft – this is a legal requirement.

The most basic aerial shot is a static overhead, using the aircraft as a very tall jib. This brings us to the first challenge of UAV work, which is inevitably vibration, common to all powered aerial craft. The camera is placed on an isolating platform with rubber mounts, but some vibration from the propellers can find its way to the camera. With movie shots, this is generally addressed by using a post-processing de-shaker, which can be a stand-alone program or a plug-in, available for all the major editing suites. The film maker will make allowance for this (typically by shooting slightly 'wide' to allow the de-shaker enough space to crop).



Using the UAV as a low-altitude dolly enables some terrific and creative views, such as panning shots that glide across 'impossible' terrain. Fences, marshland or water pose no obstacle to a craft that can fly at head height. The UAV can track vehicles or talent, from the side or front or rear. However this takes careful coordination and should be planned and rehearsed in advance. Again, it is wise to shoot somewhat wide, to allow for some cropping and tracking in post-processing. The maximum speed of most light UAVs is around 20 miles per hour through the air, depending on payload carried.

There is a trick that dolly and rostrum operators have used for years that is especially valuable with UAVs. Imagine that a particular shot calls for a long camera traverse which ends with a close-up at a precise location. This needs the pilot to steer the aircraft and make a perfect final approach with the camera in exactly the right orientation. Much easier, if possible, to start at the precision location, fly away from the scene, and then reverse the shot in the editor. This works well for static scenes, although it is less practical if someone is riding a bicycle in the shot!

In case you were wondering, people do not record sound on a UAV. Although not as noisy as the petrol helicopters of old, the propellers still make quite a din, and the draught needed to hoist 5kg or more into the air would defeat even the best noise-cancelling microphones.



Each UAV tends to be tuned and configured to one type of camera (Redcopters uses primarily Canon). This is because the aircraft will be adjusted for correct centre of gravity, and the video ground link will be set up for one camera. There will be a weight and size trade-off on the choice of camera: a heavier camera means a shorter flight time. However, any competent operator will do their best to accommodate requests for different gear.

The degree of camera control that is available to the ground operator varies. At its simplest, there is no control at all, and while this might seem limiting, it has the benefit of lowest weight and least battery drain, which is good for flight duration. Typically however, camera tilt control is available from the ground, and also panning. Camera shutter may or may not be remote-controlled; it adds complication and is not always necessary.

A light UAV can be airborne for 10 minutes or more on each flight, although this could be affected by heavy payloads, side winds, low temperatures or fast manoeuvring. The operator will always advise on how to maximise shooting time for each flight. You can get good value from a day's hire with some smart planning of the shooting schedule. Just make sure that the UAV operator is fully briefed on your objectives and that there is a clear outline for the day's events.

