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COMPARISON OF UNMANNED AERIAL VEHICLES

An unmanned aerial vehicle (UAV), commonly known as a drone, is an aircraft without a human pilot aboard [1]. Over the last 30 years, the number of UAVs in the world has grown exponentially. Most of the applications are used in the military sector and the civilian sector. And of course, in the DIY (do it yourself) sector where there are thousands if not millions of users developing all kinds of software and hardware platforms for UAV's. In 2016 the Federal Aviation Administration predicted the growth of the number of civilian drones to 15 billion by 2020. There's widespread interest in UAVs. In fact, there were 15,000 drones sold in the US alone every month. The sphere of apply usage includes agriculture, photography, inspection, construction, border patrols and producing movies. So, nowadays almost everyone can have a drone at home. And it raises a problem of choice. Which drone to choose?

To find out which UAV is the most optimal for professional and everyday usage we will compare the features of three different drone`s models: DJIN Phantom 2 Vision+, Parrot AP Drone, Blade 350 QX2. All submitted models are intended for taking aerial photography and shooting video, also delivering small payloads.

1. Flight time

"Flight Time" refers to the amount of time a drone is able to fly on a single charge [2]. There are several factors that determine a particular drone's flight time (battery size, weight, and flying maneuvers). The flight time measurement gives the amount of time the drone will fly with no additional weight added, so if additional weight is added, the flight time decreases. DJIN Phantom 2 Vision+ has 25 minutes of flight time; Parrot AP Drone – 12 minutes; Blade 350 QX2 – 10 minutes.

2. Operating range

Operating range means the maximum distance the drone will travel from the transmitter without losing connection [3]. You can operate DJIN Phantom 2 Vision+ on the distance of 610 meters, Parrot AP Drone – only 50 meters and Blade 350 QX2 – 800 meters.

3. Payload capacity

"Payload capacity" is the weight of the cargo the drone can carry [3]. It is one of the most important characteristics due to direct purposes of this type of drones. The ability of lifting heavy loads gives you an opportunity to improve your drone`s options by adding better digital camera to it, for example. Also you can use a drone directly for transporting cargoes. DJIN Phantom 2 Vision+ can carry around 300 grams; Blade 350 QX2 – around 250 grams; Parrot AP Drone lifts around 180 grams.

4. GPS sensors

GPS sensors are usually only found in expensive drone models, and are really useful [2]. They allow you to use features like "Flight planning", "Return Home", "Automatic landing". The GPS sensor is presented only in DJIN Phantom 2 Vision+ so only this drone has these functions.

5. Camera specs

All of chosen UAVs have onboard cameras. For Camera comparing, we have chosen three characteristics: the number of effective pixels, video resolution and FOV (the field of view).

Consider the number of pixels the sensor uses specifically to capture image information [3]. It will generally be lower than the number of total pixels for the camera. The first two models have the same quantity of pixels – 14 Megapixels, and the third one - Blade 350 QX2 has only 2 Megapixels.

The display quality of the built-in camera's video image [3]. Drones tend to have high-definition cameras which will display in either 1080p or 720p. There are very few drones that offer 4K resolution. All of above mentioned three drones have equal video resolution – 1080p.

The field of view is a measurement of the subject area for the drone's built-in camera[3]. A wider field of view means the drone camera sees more. All of the chosen UAVs have different angles of view: DJIN Phantom 2 Vision+ has 110º/85º; Parrot AP Drone – 92º; Blade 350 QX2 – 120º.

Also all of these models are equipped with Stabilization gimbal that holds camera steady.

6. Price

The chosen drones belong to different price categories. The most expensive is Blade 350QX2 – 1099, 99$. The second is DJI Phantom 2 Vision+ with price 649$. And Parrot AP Drone costs only 190$.

Taking into consideration all above mentioned we can state that it's preferable to choose DJI Phantom 2 Vision+. It has better Camera specs and sufficient Payload capacity, which are ones of the most important characteristics because of purpose of these UAVs. Moreover, it has GPS sensors, which allow you to use such necessary functions as “Flight planning”, “Return Home” and “Automatic landing”. Overall, the DJI Phantom 2 Vision+ is the best drone available for consumers. It comes with everything you need to fly, and it performs phenomenally.

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