



# RC REPORT

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## Freewell Action Camera & Drone Gear filters

**W**e're all aware of the popularity of drones or multi-rotor aircraft. As with all markets, add-on accessories emerge to enhance the functionality of those products. Empire Hobby, which distributes the popular DJI line of drones, also has all of the add-on accessories your customers will need.

The case in point is the fantastic DJI Mavic; this little wonder fits in a carrying case half the size of a standard shoe box. And it is not just the compact size, but its flight characteristics are also well known to be several notches above average. Like most compact drones there is a letdown. One thing that most digital FPV or photo drone cameras lack is a true iris, or adjustable aperture, to control the amount of light allowed to the sensor.

There are options already in place on the Mavic's camera to help with this, but more is needed. Anyone who enjoys photography as a hobby already knows the next best thing to a true iris is a neutral density filter to control incoming light.

To fill this need Empire Hobby is now offering the complete line of Freewell Action Camera & Drone Gear lens filters as well as other items for DJI drones. Available to fit a variety of cameras in the DJI line of drones, Empire Hobby provided us with a four pack of the Freewell filters for a Mavic camera (#FW-MAV-4-PACK). The filter pack is compact and comes neatly packaged in a padded nylon case that will do an excellent job of protecting the filters from damage through normal use.

The Freewell filters are sold in one, two, four or six filter packs. As the number of filters included in the pack increases, the level of filtering or other effects increases as well. Each filter is labeled with its equivalent f-stop value or function for easy selection. The four pack tested contains filters of the equivalent value of four, eight and 16 f-stops and a CPL (Clear Polarized Lens) for glare reduction. Also included with the package is a handy lens cleaner that will fit in the case as well.



Mounting the filters to the camera's lens is super easy. Within the inside ring of the Freewell lens is a thin layer of rubber to provide a friction fit. The filters simply slide in place over the lens, and are in-turn held securely by the rubber friction ring. While the Mavic camera's lens diameter is no bigger than the size of a quarter, even with my older arthritic fingers the lenses proved to be very easy to install and remove.

Everything sounds good so far, but the real test is to go out and fly with and without the filters and then to examine the photos for proper exposure and therefore quality. Keep in mind that since we already know the drone flies, that's not part of the evaluation. What was done was to take the drone to the local flying field at 3:00 O'clock in the afternoon, with the summer sun at its peak, generally a bad time of the day for shooting photos into the sun.

It's rather well known that I happen to be a little on the techno-nerd side [*Just a little?* – Ed] but without access to a million dollar studio and laboratory the method used for testing was to use the common sense approach, something that is more easily understood by your average customer anyway. What was done was to take several reference photos from different angles first without any of the Freewell filter mounted and on the second session take additional photos from similar angles with each of the different filters mounted in succession.

Starting with the basic camera the photos were badly overexposed and lacked detail. Actually they were so over exposed the photos were mostly just glare. Even as familiar as I am with the flying site, details were difficult to pick out in any of the photos.



*The Mavic drone uses a 20mm outside diameter lens and the filters are mounted by sliding the piece over the lens and a sticky rubber ring on the inside of the filter does an outstanding job of holding the filter in place through basic friction.*

## Adding significantly to the versatility of a drone's camera.

First up was the CPL or polarized lens. As expected there was some improvement in the photo quality and some of the details are clearer. For those not attuned to photography please understand polarization does not reduce the light entering a camera's lens. Its prime function is to reduce glare, and for this reason it's the filter photographers most often use when taking pictures of a water scene.

Next up was the NDF-4 filter, which as mentioned is the equivalent of the number four f-stop on a so equipped camera's iris. The results were considerably better, but not yet what we were looking for. Details in the landscape began to emerge, but more improvement was needed. By changing to the NDF-8 (number eight on the f-stop scale) more of the field's details begin to emerge and some of the haze was starting to be reduced. Lastly was the NDF-16 filter, which was used in combination with the CDL (did I fail to mention the filters can be stacked?).

With the NDF-16 Filter, the combination of the f-stop filtering and polarization does its job nicely. The flying site came alive with detail and the afternoon haze had been completely eliminated. With further tweaking of the Mavic's internal camera settings the photos could really be made to pop. Although for purposes of this evaluation only still photos are mentioned, I can quite honestly say without hesitation that when taking videos the use of the filters will also help tremendously.

The intention of this evaluation is to show how the Freewell filter pack can make an unsuitable setting into a great picture by simply installing an appropriate filter. As previously mentioned the testing was purposely done during the peak sun of a summer's afternoon, but to give you the complete flying conditions, the wind was about 15mph with gusts to 20+ from the water's edge along with a typical summer's day of high humidity. The Mavic's control board was squawking every wind warning it could come up with but to its reputation the drone held its position, allowing for photo after photo to be taken without faltering.

Although this review was on the pack of filters designed with the Mavic in mind—20mm O.D. lens—as mentioned the Freewell Action



Available in a variety of sizes for different drone cameras and also available in a variety of different filter combinations, the Freewell filter packs are an inexpensive way to improve the quality of drone photographs by varying the amount of light entering the camera's lens, in many cases taking a poor-quality unuseable photo and turning it into a high-quality work of art. And even if the consumer doesn't feel the need to improve the quality of his photos, a filter should always be in-place as it is an inexpensive way to protect the camera's lens from an unexpected impact.



*Photos were taken on a typical summer afternoon and in the case of the review the glare was so strong it required the use of my hand to block the sun coming into the eyepiece so I could focus on the subject at hand, yet with the appropriate filter installed the photo from the drone came out clear and completely useable.*

Camera & Drone Gear filter packs are available in a variety of sizes for different DJI drones. These packs are a great option for DJI products or other drones incorporating cameras with similar size lenses. Keeping the CPL filter mounted at all the times is a great way to protect the Mavic's lens from damage, as if the pilot goes in hard, a filter is much less expensive to replace than the camera's lens. [Almost all photographers use an add-on filter of some type as lens protection for their cameras. Dennis A. uses a polarized filter; my preference is a UV and haze. – Ed]. The price of the filter packs is based on the number and assortment selected and they are a bargain compared to the improvement in the quality of the photos and video.

The Freewell Action Camera & Drone Gear filter packs are a great add on sale items for any dealer's drone department. The filter packs along with other Freewell accessories are available from Empire Hobby. **HM**

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