



## Drones



### Cool tools or dangerous toys?

As they become more common for video editors, should we be worried? I've got one, I've also completed the Sub 20Kg Commercial Theory Course which is mandatory before gaining a PFCO from the CAA here in the UK.

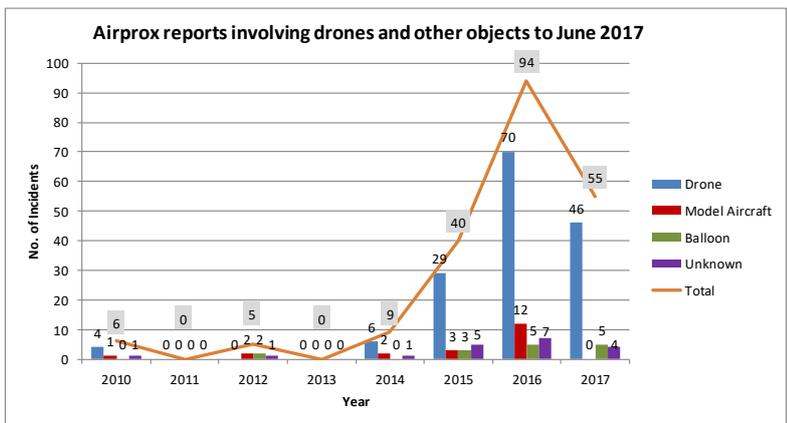
Are drones the dangerous toys some allege, or is it just a few irresponsible owners that tarnish the "optics", as the news reporters say?

How much regulation or training should be required, should all drones be registered, should the manufacturers or retailers be more pro-active, or are these just good fun, hi-tech toys?

As always, contact me [here](#) if you have any comments, suggestions or points to raise!

Adrian

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  - Shooting Underwater Video
  - The Newbie Room
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<https://www.airproxboard.org.uk/Topical-issues-and-themes/Drones/>

14th July 2017

<https://www.cinema5d.com/russian-company-sells-hack-to-disable-dji-drone-no-fly-zone-feature/>

### “A Russian-based company is selling hardware and software hacks that disable the DJI drone No Fly Zone (NFZ) feature that prevents their UAVs from flying in restricted air space.

DJI is among one of the biggest drone manufacturers in the world and therefore regularly faces pressure from the public and authorities for being partially responsible for the safety of their products. Even though full responsibility still remains in the hands of drone pilots, DJI implemented a drone [No Fly Zone](#) feature (or Geofence) to their products. It is an informational feature which uses GPS and prevents DJI drone pilots from flying in, or taking off from, restricted zones. There are already many areas in the DJI map where their drones will not be able to fly, like airports for example.

A Russian-based hacker group called CopterSafe reacted to this restriction by selling products that disable the implemented drone No Fly Zones feature on DJI machines. Those are of course of dubious legality – and they offer both software and hardware hacks for various DJI models in various price categories. They even offer software that removes altitude and speed limitations of DJI drones. This seems to be similar to chip-tuning a car, enhancing the machine’s performance at the risk of damaging it or shortening the drone’s or the battery’s life span.....”



## 10bit 4:4:2

Mean anything?? If not, read on.

*"In short, it offers more tone in colours with less risk of banding in gradients. It makes it easier to chroma key or green screen your footage. It also makes it easier to correct and grade your footage with minimal loss.*

*The way most current DSLRs work is that they capture 8Bit 4:2:0 footage. This means for every group of 4 horizontal x 2 vertical pixels, it records colour from two of the top row, and zero from the second row. These colour pixels are then expanded to fill in the gaps.*

*10Bit 4:2:2 means that for each 4x2 pixel grid, 2 colour pixels are recorded from the first row, as well as 2 from the second row. This results in much cleaner footage for things like green screening....."*

<http://www.diyphotography.net/10bit-422-video-actually-means/>

So, 3 different things going on here:

### Colour bit depth - 8 or 10 bit

Most cameras record internally with 8-bit color. This means that each variation in color is defined as an 8-bit value, or 8 numbers in binary. This leads to 256 possible variations in color hue. 10-bit color, as you might expect, uses a 10-bit value which leads to 1,024 possible variations in color hue with just a 20% increase in bandwidth. Similar to 4:2:0 color sampling, 8-bit is common for distribution and doesn't look much different from 10-bit color, to the eye. The large amount of extra color information in 10-bit color can make a huge difference in color correction. However, a camera's image sensor has to be able to resolve the difference in color hue or the extra color bit depth will just show an increased amount of noise. It is for this reason that most cameras do not record at or output 10-bit color, with a few exceptions.

### Chroma sub-sampling

One of the oldest ways to cut down on the amount of information in a frame is through chroma sub-sampling, which has been around since the analog days. It reduces the bandwidth of video by skipping the color information on some pixels, depending on the level of sub-sampling. A luminance value (brightness/darkness ratio) is still recorded for every pixel. A 4:2:0 image, which is the chroma sampling method used in AVCHD and XD CAM EX, only changes color every fourth pixel. Where 4:2:2 sub-sampling changes color every other pixel. 4:4:4 color sampling retains all color information. The eye is much more susceptible to differences in luminance, so the loss of color information is very hard to spot, but it is there. This is why almost everything is distributed in 4:2:0. However, if you plan on doing heavy post work such as green screening and color grading, then it is much better to have footage that is 4:2:2 or higher, because the more you push footage the more sub-sampled color shows.

### Compression

A 1920 x 1080 video signal with 4:2:2 sub-sampling and 10-bit color depth will take up a huge amount of space, about 10GB per minute. **Intraframe** compression is older and but less good at lower bitrates, but modern intraframe codecs can achieve virtually lossless results at relatively low bitrates (compared to uncompressed video). For example, ProRes 4:2:2 is a 10-bit 4:2:2 codec that records at 220Mb/s which equates to about 1.65GB per minute. **Interframe** compression is more modern but can suffer degradation with high variability between frames footage.

Overall, the actual codec used is probably the most important factor for the average user.

From the following sources:

<http://www.diyphotography.net/10bit-422-video-actually-means/>

<https://www.bhphotovideo.com/explora/video/hands-review/stop-worrying-about-compression-camera-video-recorder>



## Shooting Underwater Video

### Light

The essential thing for most videographers. This article is about the visible light spectrum, we are definitely not getting into the infra-red!! By necessity, it will be a little longer than average, but stick with it!

There will be a minimum of physics involved so be prepared. Here are some necessary facts:

*Water is roughly 800 times denser than air*

*The colours in sunlight have different frequencies*

*When light waves travel from one medium to another (i.e. air to water) there is a change in speed.*

*The human brain is amazingly good at compensating for deficits. Cameras are not so good, they see what is there, no interpretation occurs!*

*Lovely brightly coloured fish move much, much quicker than a diver. Even dull, grey ones - like sharks - are well known for being a bit slick around the place.*

*Divers (if they are good) are neutrally buoyant, so going up or down to follow a subject is sloooooow, going round is quicker but not much!*

*Using the coral for a camera rest will get you a good kicking when you surface. U/W tripods are available but more for professionals.*

So, because water is very dense, **all light is absorbed very quickly**, much more so than in air. This means exposures and speed/apertures need to compensate for much less light being available.

The different frequencies in light get **absorbed differently**, with the longest wavelengths disappearing quickly and the shortest less so.

When crossing a boundary from a mask to the water, or from a camera housing/lens port to the water **light may "bend"** because the speed changes.

What you "see" is not **what the camera "sees"**.

You only have a **limited amount of life sustaining air** to chase your subject around.

You will get knackered (and use more air) **performing complex manoeuvres** underwater.

Putting all these together we have a tough situation for a videographer to handle.

Newcomers, with their new U/W camera, wail :

*"Why is everything dull and blue, where have all the colours gone?"*

*"Where do all the lovely fish go?"*

*"Why am I so tired?"*

*"Why is this dive so short?"*

(also wondering why they have spent so much money on a piece of kit that appears to be rubbish!!)

Life is much more difficult underwater!

Cont.



Many of these issues can be minimised if you carry your own light with you.

U/W Video lights are not cheap and for most of us in the hobby bracket, we can still get good video in the right conditions, with care and attention.

What's to be done about it all?

### Short answers:

Most cameras can cope adequately with exposure issues unless diving deep.

Setting the white balance every metre or two of depth difference is essential

Magnification and distance distortion just have to be learnt and compensated for (unless you have a [Hydrooptix Mega 4.5DD](#) mask like mine!)

Get to know your camera really, really well to appreciate how it "sees" the underwater world

Plan and plan and plan your shots, wherever you can.

Get fit, stay fit and keep a close eye on your gauges!

### Longer answers:

#### Light Loss

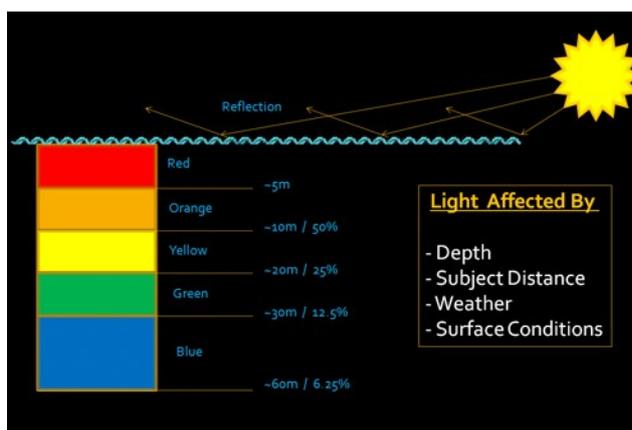
At the hobby end of the range, most cameras will cope adequately at recreational diving depths down to 25 or 30m, but the ambient surface conditions will play a major part in success. Weak sunlight, overcast and cloudy conditions will reduce the available light and therefore the depth that the light penetrates. Rough water can also play a part, particularly in shallow depths, where the shadows and glare produced can bounce around the sand making exposures a bit random. Deeper diving needs lights.

#### White Balance

Look at this table:

All your red goes very fast.

So, to help compensate for this rapid loss, set your white balance as often as you can. PD has some facilities for post production white balance but not enough for full compensation in scuba footage.



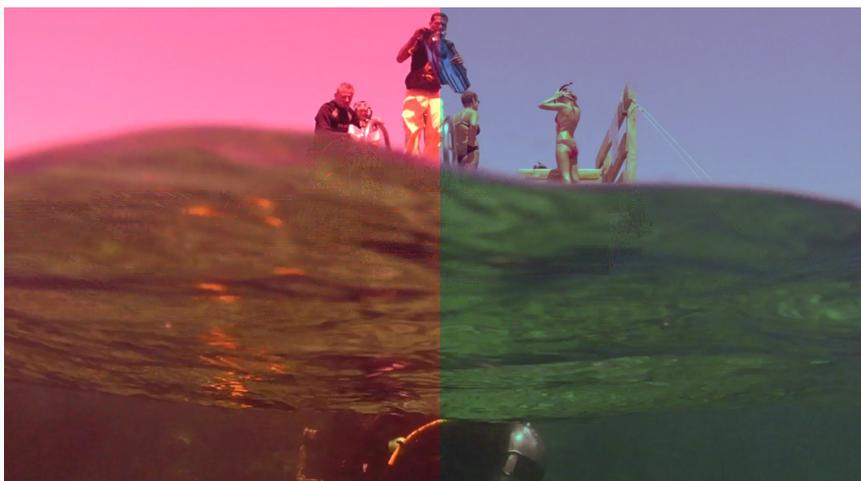
<http://www.divephotoguide.com/underwater-photography-techniques/article/basic-principles-light-underwater/>

For good scuba video, this is the single most effective thing you can do, without carrying your own lights.

Read [here](#) for a general summary on white balance.



Look at this surface shot to see how much red is applied by the camera at around 5m.



So, if your camera has a "one push" shortcut, then program it for white balance.

But, floating about in the middle of the ocean, what do you use as a white reference?

A patch of sand will do at a push (if you can see one!), but I always use my dive slate. It's on a retractor, so pull it up, fill the screen and push the shortcut. Job done. I do that as often as I can remember, although don't miss the shot of a lifetime doing your white balance, just point, shoot and hope!

This [video shot in the Red Sea in 2011](#) illustrates the wide range of colours and depths that we typically have to deal with, you can see the changes in colour and light over several dives at differing depths.

### Planning

An average dive might be 30-40mins, so if you need some particular shots, try and plan your dive around them. Take account of the sunlight and shadows, the current (most fish rest head up-current), the time of day and your dive group or buddy. Do your deep shots first, then move up to finish with your shallow shots as you do your safety stop or deco stop.

Check the current and suspended debris. If you don't have a wide angle lens, life is a bit more difficult. Remember that, ideally, we want as little water (with its associated light loss, debris and anything else) between the camera and the subject. The camera will pick up any floating debris, even if our brain filters a lot out, as we see and interpret things. Really close up shots, minimising water effects, will be mildly boring as they cannot capture the full scenic beauty. With a wide angle lens, we can get nice and close (reducing problems) but still get all the context and well composed footage.

### Summary

Underwater video is challenging but very rewarding. It does require practice and an amount of money for the kit, but with perseverance and learning your craft, you can get some great footage.

*What you do with it afterwards is up to you, but that's why you're a PowerDirector editor!*

Sources and information:

<http://www.divephotoguide.com/underwater-photography-techniques/article/basic-principles-light-underwater/>

<http://www.leisurepro.com/blog/scuba-guides/understanding-light-for-underwater-photography/>

<http://www.uwphotographyguide.com/underwater-photography-lighting-fundamentals>

<http://www.hydrooptix.com/>



## The Newbie Room

*The place to come if you are new to PowerDirector, video making and editing. Visit here to pick up some new, and useful tips.*

### CONQUERING THE FILE MENU

Click on the PowerDirector File menu, and no less than 21 options appear, and for any inexperienced user the file menu can be somewhat bewildering. The aim of this exercise is to explain the purpose of some of the important options, and how they help the budding editor achieve a stress free edit.

So let's take a look.

#### New Project Ctrl+N

Unless "Automatically load sample clips" or "Automatically load last project" in EDIT - PREFERENCES - PROJECT, has been enabled, clicking **New Project** will open a completely blank PowerDirector workspace allowing the user to begin a new project. Note however, that opening the PowerDirector program will achieve the same blank workspace.

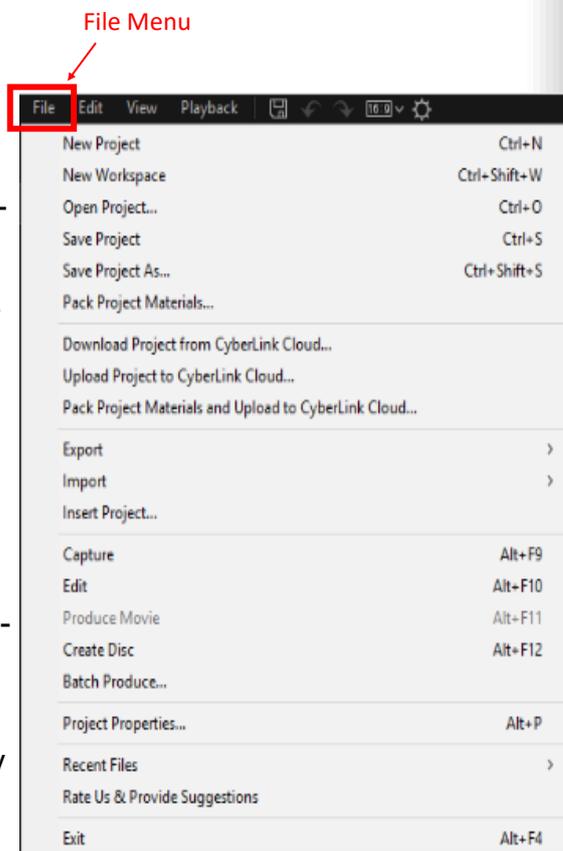
Clicking **New Project** when a project is already open will clear the workspace, but an opportunity to save the current file will be given.

#### New Workspace Ctrl+Shift+W

If a project is open and the timeline contains media, selecting **New Workspace** deletes the entire content of the media tracks. However, the contents of the Media Room remain in place. If **New Workspace** is selected it will be necessary to rename and save the project as a new one. If another saved project is opened at this point an option to merge the contents of the media room with the new project material will be offered.

#### Open Project Ctrl+O

When a project in PowerDirector is saved, a .PDS file is created, and the file is stored in a folder selected by the user. The folder is known as the export folder and can be chosen by browsing at EDIT - PREFERENCES - FILE "export folder". Selecting **Open Project** directs PowerDirector to open and display the contents of the folder for the user to select a project to open. **Open Project** should not be confused with the "Import Media" button.





## Save Project Ctrl+S

## Save Project As Ctrl+Shift+S

We'll cover the two save commands under one heading because it is important to know the difference. Using the correct save command could avoid the frustration of a completely lost project if a problem occurs with a PC or PowerDirector.

As explained above, when a simple **save** command is used, PowerDirector Creates a .PDS file. The PDS file is text file, it does not store any images, it only directs PowerDirector where to find the media associated with the project. N.B. If the media is not in the folder where it was originally, a loaded project will display black images. If the users machine fails or PowerDirector was to freeze this file could be lost, and many hours work wasted.

The prudent editor does not just use the **save** command, but will take advantage of **save as** instead. Saving files on a regular basis is essential if the above scenario is to be avoided. So, save often with **save as**, adding perhaps a number to each save.

For example, **save as** Myfile and then **save as** Myfile1 and so on.

Now if a disaster happens with your very long project all will not be lost, the files saved previously with **save as** should still be available to recover.

## Pack Project Materials

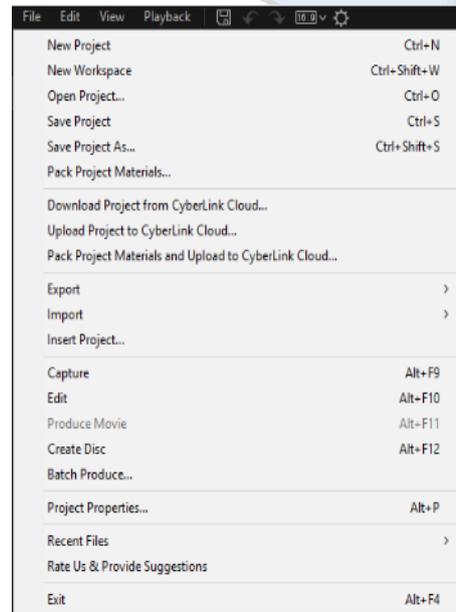
Selecting **Pack Project Materials** instructs PowerDirector to save all the media on the project timeline (not unused Media Room material) to a folder of the users choice. All clips are saved individually and a .PDS file is created and saved in the same folder.

This is useful for archiving or when it may be necessary to transfer the project to another computer with PowerDirector installed.

## Uploading and downloading projects to and from Cyberlink Cloud

Video creation can take many hours and there is nothing worse than seeing those hours wasted because a PC malfunction has corrupted the project and it is lost forever. It is essential that the projects created be backed up in some way. Cyberlink Cloud allows the user to upload projects for safe keeping.

See [this](#) video for some guidance on how to use the cloud.





## Hot tips

### Achieving the perfect pan

In the July issue of **PD News** it was emphasised that to get the very best results from moving video and panning, it was absolutely essential to have tripod with a fluid head. The problem is, even the best tripod can suffer from a shaky human hand if the operator is tense.

To alleviate the shakiness just balance your tripod tension nuts in the normal way. Now attach a large elastic band to the end of the tripod handle as shown below. Now use the band to move the camera. The elastic band takes up all the tension and shakiness allowing the perfect pan. It will take some practice, but after a couple of attempts it will be perfect.



Thanks to The Shadowman.

### Colour Adjustment for multiple clips in PD timeline

Ynotfish [posted a nice workaround](#) for adjusting multiple clips, using a saved custom preset from ColorDirector and the Apply to all function.

The Toot can be found [here](#).



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## Places to visit

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### Tutorials

[Official CyberLink Tutorials](#)

[PD University](#)

[Hans van Kempen's Starter Course \[for Dutch users\]](#)

Also many of [PDtoots tutorials](#) are useful to PD15 users.

### Members Resources Websites

GodfreyZA's Templates:

<http://oneclickmobi.com/powerdirector-templates/>

Barry Gill's resource page:

[http://www.bgillcyberstudio.com/barry\\_gill\\_cyber\\_studio\\_002.htm](http://www.bgillcyberstudio.com/barry_gill_cyber_studio_002.htm)

Eric Matyas music page:

<http://soundimage.org/>

### Useful Documents

Future Suggestions:

[Q2 2017 wishlist](#)

[Q3 2017 wishlist](#)

Guide to Good Posting

[Before Posting](#)

### Resources

DirectorZone

[Effects, particles etc.](#)