CREATIVE CONTENT

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EDITORIAL

When I first started this publication in 2007, originally called Australasian Camcorder, the major goal was to give interested beginners, hobbyists, enthusiasts and professionals alike, information on using dedicated camcorders, accessories and relevant software etc to create films, videos and "home documentaries" (a term one of my original writers coined).

As well as reviewing new models from Canon, Sony, Panasonic, JVC, Hitachi and Samsung, we also looked at all of the major video editing packages at the time from companies like Adobe, Sony, ULead, Corel, AVID, Grass Valley and Apple.

Also in the mix were audio packages, special effects and motion graphics programs and of course, microphones and accessories. We even had a specialist writer dissecting movies, giving us reviews and tips on how some scenes etc were created.

How's things have changed.

In terms of cameras, only Canon, Panasonic and Sony are left in terms of true camcorders. And the basic point and shoot cameras that evolved to also record basic video have been usurped by the rise and rise of the smartphone.

Even the "pro" dSLR cameras from Canon and Nikon have now all but been replaced by the mirrorless 4/3rd units from Sony, Panasonic and Olympus etc, although Canon bravely marches on with the new R series EOS models.

One bright shiny light though is Australia's very own Blackmagic Design who continually set the benchmark with innovative marketing and new products, and we have seen the acceptance of the so-called "action can" and drones as mass market items..

In terms of software, Adobe is still there, bigger and better than ever. Sony flogged off its products to German company MAGIX, Corel, which absorbed ULead, seems to have decided video software is no longer a viable proposition, AVID and Grass Valley I hear little if anything from, and Apple is, well Apple.

Finally, the smaller plugin companies that proliferated have mostly been taken over by companies such as Red Giant and Borisfx.

All in all, there has been a massive shakeup in the industry over the last few years, even as video is more popular than ever!

But just as the industry has changed, so we have to as well. A publication / website like Creative Content (as it is now called – and can also be found at www.cre-8.com.au) cannot exist without some sort of revenue.

It's a sad fact, and I cannot pretend to understand why, but the major vendors in the industry - with the notable exceptions of Blackmagic Design and Sennheiser – have decided over the last 12-24 months there appears to be no value in supporting us via advertising or marketing, despite the enormous potential reach we have for any single story due to the way we promote.

For example, in any given week, a combination of a camcorder / camera review, GoPro tutorial, drone comparison, a story on an Adobe Creative update, an audio tutorial and an article on lighting has a potential cumulative audience of over 700,000 people.

So, I am encouraged that there was a positive result to my recent quick survey as to readers thoughts on a specialist paid version of a Creative Content website / e-magazine.

And so here we are.

This is the very first of the 'new look' Creative Content e-magazine .

This edition is free of course, but future editions will attract a **Platinum Pass subscription fee** of a very modest AUD$29.95 per annum and will be available either via email direct to you as a PDF or on-line as an interactive e-book.

The basic website will stay free as is, however a little down the track, also incorporated in the **subscription fee will be access to further premium materia**l and I am also working on getting members some worthwhile product discounts.

Please let me know what you think via **david@creativecontent.au** as I value any ideas or feedback.

And as always, thanks for the support.

David Hague
Publisher

WHAT'S NEW?

WE ARE NOW MUCH MORE THAN VIDEO, PHOTOGRAPHY AND AUDIO

BY
DAVID HAGUEIMAGE

When planning this update to Creative Content, I wondered what other things I could bring in to make it more interesting to a wider audience and well, a little bit different.

And I think I may have found it in a way I hadn't thought of before, involving a number of aspects of 'creativity' that are also useful in the video, filmmaking and photography world.

To start with, have a look at this **video**. It looks like something that would be shot to be used in an episode of a TV series like Heartbeat or Midsomer Murders, doesn't it? But in fact, it is a very clever combination of a model railway set, electronics to control it, 3D model making, compositing video with Vegas Pro and the artful use of GoPro cameras to shoot it all.

Coincidentally, I have been spending a few hours here and there over the last few years building a model railway set in a shed in our backyard.

Additionally, as long-time readers will know, over the pandemic period I had a part time gig at the local **Jaycar** store (if you are not familiar with Jaycar, think the old Tandy Electronics, Dick Smith, or if in the US, Radio Shack) and in that time, I became interested in 3D printing. I ended up buying a Flashforge Adventurer 3D printer that is connected to my PC and uses driver software to build 3D models using rolls of PLA plastic.

There are lots of different colours and textures of PLA (and other types of plastic too for different purposes), and you can even change rolls mid printing to allow for multi-coloured models. Other 3D printers use resin to build very detailed models and are popular with role playing gamers to make miniatures for their games.

You can download 3D models from websites such as Thingiverse, Redpah and Cults3D – many for free – or you can learn 3D modelling via specialist 3D applications.

I use and recommend Maxon Cinema 4D but there is a powerful and free public domain package called Blender, which like Cinema 4D, is Mac and Windows compatible.

Using Cinema 4D I have built all sorts of things for my train set such as street lights and buildings, and plan to light these with Arduino electronics (see below). I have also built, and 3D printed day-to-day things such as hooks for kitchen utensils and made custom brackets for GoPro camera mountings plus stands for my Blackmagic Design ATEM Mini Pro and Loupedeck CT Controller.

Also in my Jaycar period, I was introduced to a product called the Arduino Uno. This is a specific little public domain circuit board with a very clever processor on it and input and output ports allowing all sorts of things to be connected to it.

The Arduino Uno is programmed using a 'C' like language, and once you get the hang of it, you can create some very sophisticated electronics for very little cost.

(I was made aware of a night club that uses Arduino to control its entire lighting system and at the other end of the spectrum, a customer I had used an Arduino board to self-build a custom irrigation controller system for his garden).

You can get a 'Starting Arduino' kit with a UNO board and a whole bundle of electronic bits (LEDs motors, resistors, transistors, sensors etc) along with a lesson-based booklet that takes you through the basics up to quite advanced stuff, by building and programming real circuits.

It costs about $180. A cheaper version is also available but you'll have to download the lessons and the number of components is not as large.

Be aware though, I have found Arduino to be very addictive!

So, putting all that together, my new sections are based around the combination of the creative use of 3D modelling and printing, Arduino electronics and what you can do with a combination of these along with video and photography.

Let me know what you think! I'll be starting off in this issue with a more detailed explanation of each to get you started.

NEW SENNHEISER EW-DP SKP PLUG IN TRANSMITTER

At the end of October, the EW-DP SKP plug-on transmitter will complete the EW-DP series for videographers, broadcasters, and filmmakers. On board: 32-bit float recording, which – in combination with the series' market-leading 134 dB dynamic range of the transmitter – ensures distorted audio is a thing of the past. No matter what signal is to be recorded on location, whether a whisper or an aircraft taking off, everything can be handled by the SKP without the videographer having to reset levels. Video recording will become faster, easier, and totally reliablemagnatur?

The complete artticle can be read **here**.

PHOTOSHOP ON THE WEB

Adobe has released Photoshop on the web as part of all Photoshop plans, complete with newly released Adobe Firefly generative AI features including Generative Fill and Generative Expand. This is a major milestone since we introduced Photoshop on the web as a beta experience, where we started with an early preview of image editing capabilities. We have collaborated with our community and received valuable feedback from thousands of users in more than 40 countries. With this release we are starting with a focus on the needs of creators who are new to Photoshop with a streamlined user experience. And, of course, existing Photoshop users, who want access to tools like Generative Fill from any web browser, will also benefit from Photoshop on the web.

With Photoshop on the web, you now have more ways to access the power of Photoshop and can get started in just a few clicks with no download or installation. You can start new creations from scratch or pick up where you left off on any Photoshop document on the web and if you prefer, you can jump back into the desktop app with the click of a button. You can also invite others to collaborate with you - even if they do not have a Photoshop subscription - by sharing a link.

The complete artticle can be read **here**.

ROGER WATERS RELEASES NEW VERSIONS FROM DARK SIDE OF THE MOON

Dark Side of the Moon is one of – if not THE – seminal albums of all time. And Roger Waters, the major writer and ex-bass player from Pink Floyd has just released a new version of one of the tracks from the album.

I am guessing as I don't know for sure, that is has, video wise, been created in Adobe After Effects. And I am sure there is a plug in from either BorisFX or Maxon Red Giant involved. I have asked both if they can confirm.

You can listen to the track **here**
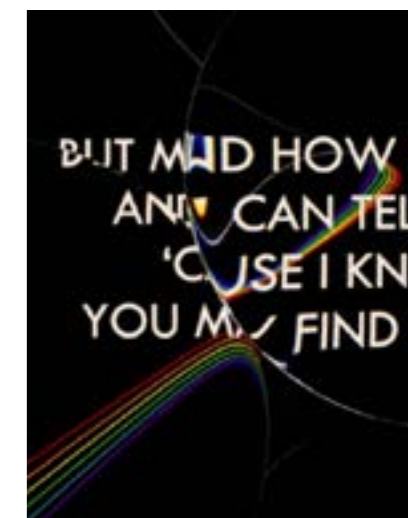
DJI LAUNCHED NEW MINI PRO 4 DRONE

Just when you thought you had worked out all the tricks with the Mini 3 Pro, DJI has released yet another sub 250g drone, not surprisingly, named the Mini 4 Pro.

So, what makes this different from its predecessor?

First and foremost, DJI has upgraded the camera system with a whole new image processing system making it now possible to shoot 4K / 60 fps in

HDR, added a new Night Shots system and the option to use D-Log M and HLG colour profiles. You can also shoot slo-mo in 4K and capture true vertical imagery.

Whilst it's a bit of a moot point, legally speaking, DJI is claiming super dooper stability even when at maximum range which said to be 20Km. An adjunct to this is that the Mini 4 also now has full omni-directional sensing to avoid collisions with objects.

A major update is the inclusion of adding waypoints to a flight paths letting you repeat a flight and whilst the 3rd party :Litchi software has always allowed this, the fact it is now included in the firmware for the RC and RC Pro controller is a Big Thing in my book.

Full specifications, images and video can be found by clicking **here**.

PGYTECH HAS A NEW CAMERA QUICK RELEASE

CapLock is a versatile solution for attaching cameras and phones to a wide variety of mounts and tripods. CapLock holds devices securely, but it also releases them in a second when required, with no fumbling or effort.

PGYTECH's CapLock system offers two types of bottom interfaces: a 1/4-inch screw thread version for wide compatibility with equipment from all good manufacturers, and a ball-head quick release version that enhances most existing PGYTECH gear. CapLock can add a great new capability to new or old camera mounts – effectively upgrading older products at an affordable price. See more **here**.

GOPRO Q & A

BUYING A NEW CAMERA CAN BE EXCITING! BUT WE ALL HAVE QUESTIONS AND THESE ARE SOMETIMES HARD TO FIND ANSWERS TO.

HERE ARE SOME OF THE STANDARD GOPRO ONES - AND THEIR SOLUTIONS.

n the various GoPro forums, there are standard questions that pop up again and again. Here is some samples and the respective answers to help all those with similar issues.

Question:

When I download my GoPro video files to my computer, they won't play back. Audio does but there is no picture.

Solution:

This is usually as the required codec required to play the video is not installed on your PC . If you don't have that codec installed, never fear; it is an easy fix. Simply Google HEVC, or easier, if you are on a Windows based computer just go to the Microsoft Store and install it. A more detailed explanation is at **https://cre-8.com.au/why-wont-my-video-playback-from-my-gopro-or-other-hi-res-capable-camera/**

Question:

My GoPro shuts down after only a few minutes shooting as it gets very hot. Is there a solution?

Solution:

GoPros are noted for overheating, and indeed, in the Hero 12, the company has tried to address this by removing the GPS ability. Why? Because things like GPS, Bluetooth, WiFi, Voice Recognition and other features all generate heat. If you are not using any of these, turn them OFF in the menu system.

Question:

What is the best memory card to get for my GoPro?

Solution:

Especially if you are shooting in the higher resolutions, you need the fastest card you can find, as a card that is too slow will either drop frames or

simply not record at all. And stick with brand names – we recommend and use Verbatim – as cheaper cards are often inferior. On each card, there is a series of numbers and letters that designate the card's rating for speed etc. A full explanation can be found at **https://cre-8.com.au/which-sd-cards-there-is-more-than-meets-the-eye/**

Question:

What are the best settings for video and photos?

Solution:

This is one of the most common questions and I'm afraid there is no single answer as there are a lot of variables. What is the subject of your video or photo? What distance are you from it? What is the ambient light like? Is it cloudy? Are you shooting into the sun or away from it? Is the camera handheld or on a gimbal or tripod?

It is necessary you have a basic understanding of photography and video in order to understand what settings to use under different conditions. At Creative Content I have many tutorials under the GoPro and Drones sections that will help.

Question:

Do I need an ND filter?

Solution:

Unless you are shooting something like running water to get that blurry / dreamlike effect, probably

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"CAN I RUN MY GOPRO ON EXTERNAL POWER WITH A POWERBANK OR POWER ADAPTOR?"

not. An ND filter allows you to keep the shutter speed slower without over exposure. What is of general use though is a polarising filter, especially if shooting over water, to remove any glare.

Question:

What is the best software for editing GoPro video files?

Solution:

Any decent editor will do the job and there are many for both Mac and PCs such as Adobe Premiere, or the one we recommend, DaVinci Resolve (which is free). For PC only, also look at Vegas Pro, Hitfilm Xpress (also free) or products from Corel.

Question:

Can I run a GoPro on external power?

Solution:

Yes. You can take the battery out and use a PowerBank or power adaptor plugged into the USB port. GoPro also make a special "pass through" door with a hole for the USB cable (or you can 3D print one with a file to download available at **https://www.thingiverse.com/thing:4553897**)

Question:

I haven't used my GoPro for a while, and when I turned it on, nothing happened. I tried charging

it, but only the red light came on, but it wouldn't charge.

Solution:

Remove the battery, plug the charger in and try and turn the camera on. If it starts, your battery needs replacing. If not, the camera is possibly dead.

Question:

How can I get better audio?

Solution:

GoPro make an adaptor for the USB port in order to plug a mic in. A better solution is to get the MediaMod which has a built in mic, but will also allow you to plug in a dedicated mic such as the ones we use, the **Sennheiser MKE200** and **MKE400.**

Question:

Can I use my GoPro in water?

Solution:

GoPro cameras are waterproof to differing degrees

depending on the model, HOWEVER, for absolute peace of mind we'd always recommend getting the underwater housing to make sure. It only needs a speck of grit under the battery door and its bye bye GoPro! (We lost a Sony RX0 Mk II this way).

HERO 12 OR ACTION 4?

The gloves are now well and truly off with the recent releases of the **GoPro Hero 12 Black** and the **DJI Action 4**. So similar are these so-called 'action' cameras that it is inevitable they will be compared.

They look the same and are aimed at the same market demographic. So how do they shape up against each other?

Here's a blow-by-blow comparison.

PRICE

First and foremost, for many people, the price is a determining factor. Working on the base unit and not any of the "combos" or bundles, the DJI Action 4 starts at AUD$629 and the GoPro Hero 12 Black is a further AUD$20 at AUD$649.

If you add any accessories, these prices can balloon out to AUD$819 in both cases and there is a special DJI Action 4 Ultimate Pack that will set you back AUD$899 which includes 3rd party accessories from PGYTECH, Samsung and SunnyLife.

WATERPROOFING

DJI says the Action 4 out of the box is good for 18 metres, way above the GoPro at just over 10 metres. For most users though, to be fair, 10 metres is more than enough as we are getting in SCUBA territory here, not just snorkelling and swimming. If you need to go deeper with a GoPro, then of course there is a housing available giving waterproofing to a whopping 60 metres, and this will set you back a further AUD$89. DJI has a similar housing by the way, also priced at AUD$89

I would venture to suggest that after reading copious posts on Facebook forums about GoPros dying an unnatural death in the water when there is no extra housing, the purchase of one would be a wise investment.

My guess is that most of these failures are caused by some grit or other foreign matter getting under the battery door – a fate we encountered ourselves with a Sony RX0 Mk II a few years ago whilst holidaying in Broome in WA's north west.

BATTERY LIFE

There are many variables here including the number of functions that are live on the camera (voice control, Bluetooth, Wi-fi etc) and the ambient temperature, so I'll only use the factory quoted numbers.

DJI say out of the box their batteries you'll get 160 minutes operating time. GoPro are a little more circumspect, quoting different times for different resolutions, but the maximum you'll get is 150 minutes shooting at 1080p. In the real world, this difference is neither here nor there.

RESOLUTION

Both the DJI Action 4 and GoPro Hero 12 Black will shoot 4K video even in slo-mo mode, but the GoPro takes this a step further with 5.3K also being available. A big advantage of the GoPro is the new addition of HDR (High Dynamic Range) giving more vivid imagery. The GoPro also offers higher frame rates under certain circumstances, and for still images, the GoPro blows the Action 4 to the weeds with 27 megapixels versus 10. Unless in low light as mentioned below.

Both models support 10 bit colour and gave Log profiles if colour grading is your thing.

STABILISATION

GoPro used to have the edge here, but DJI has caught up in this area and it is hard to tell them apart. One area the GoPro is better is with the Horizon Lock although DJI has caught here too from the Action 3, with 360° "Horizon Steady" now standard.

LOW LIGHT AND VERTICAL SHOOTING

The Action 4 wins here simply as it has the bigger sensor. For many though, this could be offset by the better control over vertical shooting in the Hero 12 due to its sensors ratio

of 8:7 letting you shoot vertical without turning the camera sideways as you do with the Action 4. This does vertical shooting by way of a vertical mounting bracket. If you don't use TikTok or shoot in the vertical format, then this is a moot point of course.

GPS

Now normally this would be a big tick for GoPro, but not any more as the company decided to remove the GPS chip from the Hero 12. Why GPS? Because with it there, you can display your speed, altitude and other data as overlays. DJI lets you do it with an optional GPS remote, but if you want that sort of functionality, at this stage anyway, on the GoPro it's a no-no.

OTHER

If you habitually use a Selfie Stick (shudder!) then you'll know how annoying it is to get the see the stick in your footage. DJI has minimised this with "InvisiStick" using software to mask the stick out, and while not perfect, does the job most of the time.

Another area the GoPro wins though – sort of – is in audio, as you can pair Bluetooth mics with the Hero 12 and also monitor back if you have combo Bluetooth mic / earbuds such as the Sennheiser TW Momentums.

DJI does not have this, instead opting to support its own DJI Mic Wi-fi system, which just quietly, is bloody good and equivalent in my opinion to those put out by RØDE and Hollyland, but maybe not quite as good as the Sennheiser systems - which of course cost a lot more.

The external design of both models is pretty much the same with the major differences being that the DJI supports a full front touch screen (yay!) which the Hero 12 does not, and the "finger" mounting system is magnetically attached letting you remove it as needed. The drawback there is that if you forget to put the mount on, there is no way you can attached the Action 4 to anything whereas as the built in GoPro

way means it is always there.

Livestreaming is supported by both (under the right conditions of course) and if you are a pro and need to sync up multiple cameras, both cameras offer Timecode Synch and also both have the export to gyro based data if you need the best image stabilisation possible (Blackmagic Cinema Cameras do this too with DaVinci Resolve although I have never tried it).

CONCLUSION

So, at the end of the day, it depends a lot on what you are shooting, where you are shooting and how you are shooting.

The GoPro has the better video and still resolution generally speaking, but suffers under low light conditions. When it comes to long term shooting, anecdotally (and it's a LOT of anecdotes), overheating still seems to be a GoPro issue that you never hear of in the DJI Action series.

I also prefer the DJI software interface; GoPro seems to keep mucking around with theirs and as just as soon as I have finally worked out the Hero 11, the 12 has some bits tacked on and seemingly changed the name of others.

But, as I have said many, many times, you can read all the reviews, comparisons and criticisms you like, but at the end of the day there is nothing quite like going into a decent camera store (like a Camera House say), asking questions of those in the know, and having a bit of a play to see which 'feels' the best.

What would I choose?

As a pure action camera at this time, I'd go for the **Action 4.**

WHICH DRONE?

WITH SO MANY MODELS, IT CAN BE QUITE CONFUSING AS TO WHICH TO BUY

BY
DAVBID HAGUE

With the release of the DJI Air 3, a tricky conundrum for many is to ask: "Should I buy the Mini 3 Pro or the Air 3?"

Now I don't as yet have access to an Air 3, but I do have a Mini 3 Pro and the Air 3's predecessor, the Air 2S, so can answer the question in part at least, and then fill in the gaps with known specifications of the Air 3.

As well as the Mini 3 Pro I have the Mini 2 and used this a lot until the Air 2S turned up, and this became my Go To unit very quickly. I found it easier to fly, the object detection is an obvious bonus, and the camera was far better. And the Air 2S just feels more solid in construct.

Then the Mini 3 Pro arrived, and things changed quite markedly, specifically in one area. For travelling, the Mini 3 Pro beats the Air 2S hands down due to its smaller size. The image quality from the camera is not as good in my opinion as the Air 2S has the bigger sensor and the on board 8GB storage is a major bonus, especially if one tends to forget to pack SD cards!

The difference in favour of the Mini 3 Pro of 3 minutes flying time I find neither here nor there as for peace of mind, I always allow a maximum of 20 minutes in the air thus allowing a decent margin of safety, but the Air 2S does have superior sensing technology over the Mini 3 Pro.

For me, though, the biggest major advantage of the Mini 3 Pro over the Air 2S has nothing to do with the camera specs, photo or video formats available of the Mini 3 over the Air 2S or even the physical size difference. It is more basic than that.

With the Mini 3 Pro having the RC-2 Controller containing the built in LCD screen as against the default RC-N1 controller for the Air 2S that needs a mobile device (smartphone or tablet running the DI Fly App), it is so much easier to simply pull the drone out of the bag, open the arms, turn it on and get flying quickly. Mere seconds in fact.

In other words, no more faffing about putting the mobile device into the controller holder, plugging in a cable, making sure everything is paired, firing up the app etc etc.

In fact the only drawback of the RC-2 controller is that you are hard wired to the DJI Fly app so cannot use a 3rd party program like Litchi which gives you advantage of waypoint navigation among other things.

But with the advent of the Air 3, this limitation has been thrown out as the latest DJI Fly app for the Air 3 supports waypoints. Big, big tick. So, even with the mucking about with a smartphone, you do get more flexible flying options. But better, there is a combo pack of the Air 3 that includes the RC-2 controller with the LCD. Even bigger tick.

Another advantage of the Air 3 is it goes one step further than the Air 2S in that the sensing system is now omni-directional – that is, an obstacle in any direction is now flagged as Danger Will Robinson thus making it safer and even easier to fly. The Mini 3 Pro only has Forward, Backward and Down.

The camera specs between the Air 3 and the Mini 3 Pro are close enough to make not a great deal of difference, so I don't personally find one superior to the other in the stuff I shoot anyway.

But, and it's a big one. This only applies to the main camera, as of course the Air 3 has a dual camera system with the 2nd camera, whilst still delivering 48MP it does add a medium level telephoto lens, equivalent to 70mm (as against 24mm) into the mix which for some drone photographers / videographers, is a very major thing indeed.

Your needs may be very different however, so if this is the case, you need to compare and choose according to your circumstances.

The flying time of the Air 3 is superior however when using the standard batteries, at 46 minutes versus 34 minutes (if you use the Intelligent Flight Battery in the Mini 3 Pro you'll get 47 minutes though).

So what about price? In a like for like comparison where both have the same RC-N2 controller and the Fly More Combo (extra batteries, charger, spare props and bag), DJI has a price for the Air 3 of $2349. An identical Combo for the Mini 3 Pro is $1299.

So is the Air 3 worth the extra grand and a bit?

For the part time hobbyist who maybe flies for fun on weekends, takes the drone on holidays and doesn't intend stretching it more than that, probably not. The extra advantage of the smaller size in the Mini 3 Pro for packing is a major bonus, and I'd say the added RC-2 Controller is well worth the price for the extra convenience, not to mention the brighter screen.

The Air 3 for the serious flyer is well worth the look. If you intend to try and make a few bucks out of it too, then the omni-directional sensing might be worth the extra by itself if you avoid a major stack (and don't have the DJI Care Refresh option as a backstop).

Personally, I like the bigger drone size for its stability, more tolerance in higher wind gusts and the feeling of sensor security. But hey, I am the first to admit that I am a little over-the-top when it comes to wanting to avoid mishaps having already dumped one $3K drone into the drink, never to be seen again (and no insurance).

Well, this is my take on the two models, but I do urge you if pondering which to get to also compare spec-for-spec in order to satisfy what you purchase does meet your needs, now and into the future.

Comments are of course welcome, especially if you think I have missed something!

DRONE FLYING RULES FOR AUSTRALIA

YOUR DRONE MUST ALWAYS BE MORE THAN 30 METRES FROM OTHER PEOPLE

YOU MUST NOT FLY OVER OR ABOVE PEOPLE OR IN A POPULATION AREA EG BEACHES, PARKS SPORTING EVENTS

YOU MUST ONLY FLY DURING THE DAY AND NOT IN CLOUD OR FOG

YOU MUST NOT FLY YOUR DRONE HIGHER THAN 120 METRES ABOVE GROUND LEVEL

The most common question asked about this rule is an attempt to qualify what is "ground level".

This is not defined as "sea level", but the ground at which the drone will be taking off from.

For example, if you are out in the bush and at sea level, then it means you can fly to a height of 120 metres.

If however you are on a hillside and the height above sea level at the point of takeoff is 60 metres, you can fly to a height of 180 metres ABOVE SEA LEVEL but only 120 metres higher than where you are taking off from.

The altitude of your drone should be prominently display on your controller / smartphone.

This is pretty straight forward.

It means that your drone must always be 30 metres away from another person both laterally (horizontally) and vertically (above them).

This obviously does not include the drone operator.

Drones that allow the use of goggles for a point of view (POV) of what the drone sees, in some countries must, as well as the operator, have a spotter who can see the drone in line of sight.

However, technically these typre of drones (such as the **DJI Avata**) are not allowed to be flown in open air in Australia.

YOUR DRONE MUST ALWAYS BE WITHIN LINE OF SIGHT

Maximum distance to drone manufacturers is a bit like the old wars between camera manufacturers about who had the biggest number of megapixels or digital zoom.

However, whiulst your drone might be rated as having a range of 15Km or even more, you are not allowed to fly it out of line of sight without the proper certification.

In other words, you must be able to see your drone with the naked eye at all times whilst flying.

This rule ties in with the 30 metre rule, but adds the proviso of where you can fly.

It may be tempting to send your drone over the top of your youngster's soccer match to shoot the action below or fly over a motor racing track to get some high speed footage,, but in both these cases, you would be breaking the rules.

The reasoning is quite simple; if your drone fails, even a 250g model falling from a height would seriously hurt someone.

Additionally, if you send your drone over an event such as a motor race, it is more than possible there are helicopters there filming for television and so you place aditional danger on the helicopter crew and anyone on the ground.

IF THE DRONE WEIGHS MORE 250G YOU MUST FLY AT LEAST 5.5KM FROM A CONTOLLED AIRPORT

Even a small drone hitting an aircraft could cause catastrophic circumstances.

The better drones such as those from DJI have both geofencing built in that should stop you taking off too near an airport, as well as aircraft detection to warn you if an aIrcraft is approaching (using transponder technology).

But like all the rules, this is mostly common sense.

If in any doubt, simply don't fly. And if you hear or see an aircraft in the immediate vicinity, land as soon as possible or at worst, get down to a low height to minimise aby collision.

This is pretty straight forward and is linked to the line of sight rule.

In order to fly at night you need special certification and permission (at this stage).

And while it is obvious that in cloud or fog, you'd also not be able to see your drone within line of sight with the naked eye, another consideration is that the moisture contained in the clouds or fog could affect your drone's operation causing it to crash.

At best, this would be an expensive exercise, and at worse, cause major property damage or even hit someone.

DRONES ON AIRCRAFT

**DIFFERENT AIRLINES HAVE DIFFERENT RULES.
HERE'S THE ONES FOR AUSSIE CARRIERS**

BY
DAVID HAGUE

One of the most common questions asked in drone forums goes something like this: "Next week I am travelling to [insert exotic place name and country] on [insert airline name]. Can I take my [insert drone brand and model] on the plane?"

So, in the interests of saving a lot of time and trouble for others to answer, I did some research today to see what the go is. And across the board, it is remarkable similar. Here is a list of the requirements of Australian airlines, plus Brirish Airways as a starter.

QANTAS – All batteries must be carried as hand luggage and will not be accepted in checked in bags. Up to 20 batteries less than 100watt-hours can be carried, and there is a maximum of 2 for batteries >100Wh and < 160Wh. It is recommended batteries be kept in separate containers away from each other (eg plastic bags) wit terminals covered by insulation to prevent shorting.

JETSTAR - All batteries must be carried as hand luggage and will not be accepted in checked in bags.

Up to 20 batteries less than 100watt-hours can be carried, and there is a maximum of 2 for batteries >100Wh and < 160Wh. It is recommended batteries be kept in separate containers away from each other (eg plastic bags) wit terminals covered by insulation to prevent shorting.

VIRGIN – Up to 15 100Wh or less batteries can be carried as hand luggage in a device. Up to 20 batteries < 100watt-hours can be carried as spares and must be in hand luggage. Batteries >100Wh and <160 Wh in a device can be either hand luggage or in checked baggage. There is a maximum of 2 for extras batteries >100Wh and < 160Wh and these must be in hand luggage. .

It is recommended batteries be kept in separate containers away from each other (eg plastic bags) wit terminals covered by insulation to prevent shorting.

REX – Batteries with a maximum 100Wh must be kept in cabin luggage and up to 20 / passenger. A maximum of 2 Batteries > 100Wh < 160Wh is allowed, are to be carried as hand luggage only and MUST be declared. Batteries >160Wh will only be carried as freight.

Skywest - Batteries are

carried as per the rules of its partner airlines Delta, United, American Airlines and Alaska Air.

BONZA - Batteries must be carried as carry on and suitably protected. Watt-0 Hour Rating is to be below 100Wh. There is no mention of any restrictoin on the number of batteries that may be carried, but its best to check with the staff at check-in time.

British Airways – Batteries <100Wh can be carried as hand luggage in the device only with up to 4 spares in original packaging or insulated from metal contact. Batteries kept in the device and switched off (ie not sleep mode) can be checked in.

Spare batteries in checked luggage is forbidden. Batteries >100Wh and < 160Wh can be carried in devices (max 2. Up to 2 spares can be carried kept in original packaging or insulated. Spare batteries in checked luggage is forbidden.

To calculate Wh, it is equal to battery voltage multiplied by its Amp Hours and divided by 1000.

*Ie: Wh = (V*Ah)/1000.*

LICENCE TO FLY

IN AUSTRALIA, THERE IS NO LICENCING REQUIRE-MENT TO FLY A DRONE AS LONG AS YOU STAY WITHIN THE BASIC RULES.

WANT TO DO MORE THOUGH? THEN READ ON!

If you go into your favourite electronics store or on online and buy a drone, in Australia there is no legal requirement to be licenced .

But there are certain restrictions on where, how and what you can fly. These include:

- The drone must be less than 2Kg in weight.

- Maximum height to fly is 120 metres.

- The drone must always be in line of sight.

- You must not fly within 30 metres of people (excluding spotters / the operator)

- Must not fly over groups of people eg sporting events, concerts.

- Must stay away from airports and airfields (min 5.5Km)

Many drones have "geofencing" built into them to avoid "no-fly" areas, and some even have electronics that alert them to locally flying aircraft advising you to land.

At the end of the day of course, it all boils down to common sense. Those that choose to ignore these rules are susceptible to heavy fines by the way.

THE NEXT STEP

So knowing all that, if you want to take the next step and say, wish to fly further than the "line of sight" rule, or at night say, what certification and training do you need to be able to this?

It's not quite a simple as just doing course A or B as it turns out.

As Mahmood Hussein from <u>Global Drone Solutions</u> explains, firstly CASA deems you need to either be a fully licenced operator in the same way QANTAS or smaller commercial operators such as say crop duster or joy flight companies are. Alternatively, you can fly under the auspices and control of such a company.

To be an operator, there is a special certificate called a Remotely Piloted Aircraft Operator's Certificate (ReOC)

and this allows you to operate as a drone service provider for hire. Note the key phrase here is "operate as". It does not mean you can physically fly, just gives you the licence to fly commercially, and hire other pilots.

To actually fly, you must also have a Remote Pilot's Licence (RePL). This allows you to go beyond the stage of a recreationally flyer by flying bigger drones, but there are still restrictions in the licence by itself. For example, a farmer who has an RePL can fly over his / her own land for the purposes of crop or livestock inspections, land surveying or even carrying cargo if the drone allows it.

But to allow you go that extra mile Mahmood tells me, you need to fly

under the control of a ReOC holder as mentioned. This means you can fly outside of your own property, with a drone over 2Kg, and for reward.

But even then, there are restrictions he explains. If you wish to be able to fly out of line of sight for example, you will need another certification called an AROC or Aeronautical Radio Operators Certification.

So in summary, to answer the original question, in order to be fly out of line of sight and at night you need:

- To have a ReOC (Remotely Piloted Aircraft Operator's Certificate) or operate under someone who has.

- To have an RePL (Remote

Pilot's Licence)

- To have an AROC (Aeronautical Radio Operators Certification)

COURSES AND PRICING

If we start with the RePL first, these courses are run by certified RePL trainers such as **Global Drone Solutions.** In their case, the course can either be taken in-house or online, and can also contain a component to get your AROC. If done in-house, they are taken over 5 days and include theory and practical assessments. On the other hand, if you choose to take the course online, this of course can be done in your own time, but must also include 2 days virtual classroom training via Zoom.

If you choose to do the RePL by itself, the price is AUD$1,495 when done online, and AUD$2,795 if done in-house. If you want to do the RePL AND the AROC together these prices are AUD$1,695 and AUD$2,995.

The ReOC is a bit more complicated as you have to already have the RePL, and involves you also get training as a Chief Remote Pilot before being briefed and trained on an in-depth CASA interview. I did go into some detail with Mahmood Hussein over this, but after going through copious notes, decided you might be better off to have a chat to the personnel involved at **Global Drone Solutions**.

I am guessing this level is probably a bit beyond the scope of my average reader and therefore any article to completely answer any questions will be much longer than the space allowed!

If you are in Western Australia, you can make direct contact on 0499226637 and speak to Ian Gomes or in other states, call 0487519145 and have a chat to James Hamilton.

CONCLUSION

I suspect the basic recreational drone flyer will read these articles and think, "why bother". A lot of people enjoy their drone flying within the set boundaries of an under 2Kg drone eg line of sight, ceiling etc. Most people I have spoken to actually don't WANT to go out of line of sight as they are not comfortable with that.

And for those folk, fair enough.

But there is a cohort who do push their drones to the theoretical limit. For

example, my personal favourite drone, a DJI Air2s that I use to fly for the fun of it as well as the purpose of creating articles and training videos, has a theoretical range of up to 12Km, but there is no way I'd push it anywhere near that distance. (Losing a drone will do that to you!)

And others want to make use of their hobby for commercial purposes beyond those allowed without an RePL as discussed in my first article and interview with Mahmood Hussein.

This training and registration are mainly aimed at these people who do want to go beyond the basic boundaries.

And looking longer term and accepting there will be greater numbers of drones in the sky as their prices continues dropping and with capabilities getting more and more sophisticated, I can see it does make sense to be trained.

You wouldn't drive a car or motor bike on the open road without a licence. Nor would you (or at least you shouldn't) drive un-insured. And you definitely would not drive without lessons and knowing road rules.

The same applies to marine craft too for that matter.

A drone is an aircraft, and even a smaller one such as the DJI Mini 3 can cause immense damage if in a collision with another aircraft, or by hitting someone (I sport some scars on my left arm courtesy of a hospital visit following a rampant GoPro Karma drone that suddenly fired up while I was holding it).

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"If we start with the RePL, these courses are run by certified RePL trainers such as Global Drone Services and can be taken in-house or online"

REVIEW:
FUJIFILM X-S20

A COMPACT MIRRORLESS WITH A LOT OF GRUNT FOR STILL AND VIDEO SHOOTERS ALIKE

BY
DAVID HAGUE

'Ve had a Fujifilm X-S20 for a few weeks now, and it has been an interesting exercise considering I have the baby version myself in the X-S10.

In fact, the bodies of the two are remarkably similar and they share the same controls and layout – although some of the controls on the X-S20 have been enlarged a tad, notably the two top mounted rotary dials.

Speaking of which there is now a dedicated VLOG mode and when selected, you can make relevant changes on screen using touch mode.

Fujifilm says it has increased the grip size too, and this was for good reason as the X-S20 can now accommodate the bigger and therefor more longer lasting batteries upping the shot rate to around 750, although some people have reported even higher than this which is a Good Thing of course..

Like the X-S10, charging the X-S20 is still via the USB-C port, but this has been beefed up to allow faster charging, and HDMI is has been boosted allowing direct output of 12-bit RAW video. Impressive indeed.

A new addition that VLOGGERS and video shooters will like is the addition of a headphone jack for audio monitoring as well as making the single SD card slot UHS-II compatible. Sadly there is still only one SD card slot, and it is still in the battery compartment meaning taking the camera off a tripod or gimbal may be necessary in some cases to switch cards. But Fujifilm are not alone there.

The sensor is the same BSI-X Trans 4 from the X-S10, but the processor is all new, called the X-Processor 5 and this has improved the auto focus capability remarkedly is my impression, especially in the area of the number of specific items it can track and the speed and accuracy of that tracking.

The new processor has also improved by light years the speed of shooting, multiplying by a factor of 4 in some areas such as shooting RAW files at 20fps.

In terms of video, 4K video at 60fps is a doddle and the X-S20 can record internally at 10-bit 4:2:2 and 360 Mbps as well as 6.2K 30 fps. 1080p can be shot at up to 240fps, but you can save it at 24fps meaning you get 10x slo-mo straight from the camera. Great for sport and nature shooters methinks!

FLOG2 has been implemented too boosting dynamic range to 13 stops.

The only thing I could really flaw on the X-S20 is that with lens I was supplied for the purposes of the review, a brilliant 8mm Fujinon lens (of course), if I wasn't careful, the tip of my left forefinger could sneak into the image.

Barring that small issue, would I recommend this camera and who to?

The answer is a solid definitely, especially if you have more of a sway towards the video side of things than simply still shooting – and it is easy to see that this is what Fujifilm were aiming for.

Yes, the X-S20 is small and light, but in that little package there is a lot of grunt to like.

The best price I could find currently is around the AUD$2145 from VideoPro and for that you also get a 15mm – 45mm kit lens which must be a special deal as they have the same model, body only for AUD$10 more!

(If you want the 8mm lens that'll set you back around AUD$1200 by the way, and worth every penny in my opinion).

For more information on the Fujifilm X-S20, visit the Fujifilm website at htt-ps://fujifilm-x.com/global/products/cameras/x-s20

BASIC EDITING

MYSTERIES UNRAVELLED

TO THE BEGINNER, VIDEO EDITING CAN SOMETIMES COME ACROSS AS SOME SORT OF MAGIC, BUT ONCE YOU KNOW THE BASICS, IT ALL MAKES SENSE

BY
DAVID HAGUE

DaVinci Resolve is a fully featured video editor for Mac, Windows and LINUX. The base version (which is VERY comprehensive) is free.

I saw an interesting response to a post in a Facebook group recently. A GoPro group to be exact.

The author had posted a video of a trip from a country town into his state's capital city, with the GoPro acting as a dashcam. In all, there was a smidgeon over 25 minutes of highway footage, with the author inviting people to have a look.

The first responder suggested it was a nice video, in a sarcastic sort of way, and then advised the author to "learn how to edit". I assume he meant that 25 minutes of footage out of the front window of a car on a highway is not that exciting or interesting.

But it got me thinking. How many hours of footage are shot from phones, cameras, camcorders, GoPros and drones that COULD be interesting, if a little bit of editing was applied? How much footage is lying around languishing as someone doesn't know where to start?

For some, this could be a very big step. It's all very well whacking 10 seconds or whatever on TikTok from your smartphone explain why you use black lipstick, but what if you have a story to tell that may be 15, 30, 45 minutes or longer? Where DO you start? And with what tools?

I have been digitally editing footage since 1998 and via analogue before that back to the mid-90s, so figured I might be able to help here with a reasonably quick and easy to follow primer.

So here goes ...

For this exercise I'll be using DaVinci Resolve as the video editor in the screen shots because a) it is free and b) it is available for Mac and PC (and LINUX if you are so inclined). There is also a version for the latest iPads too – but it must have the latest chips in it.

Let's assume you have 20 minutes of drone or GoPro footage you want to turn into a shorter clip by selecting only all the best bits.

First, here is some terminology:

NLE: Non-linear editor. Just a fancy name for a computer-based video editing program. It's called non-linear as you don't need to assemble the video from start to finish. You can create the middle, the end and the start, or in any
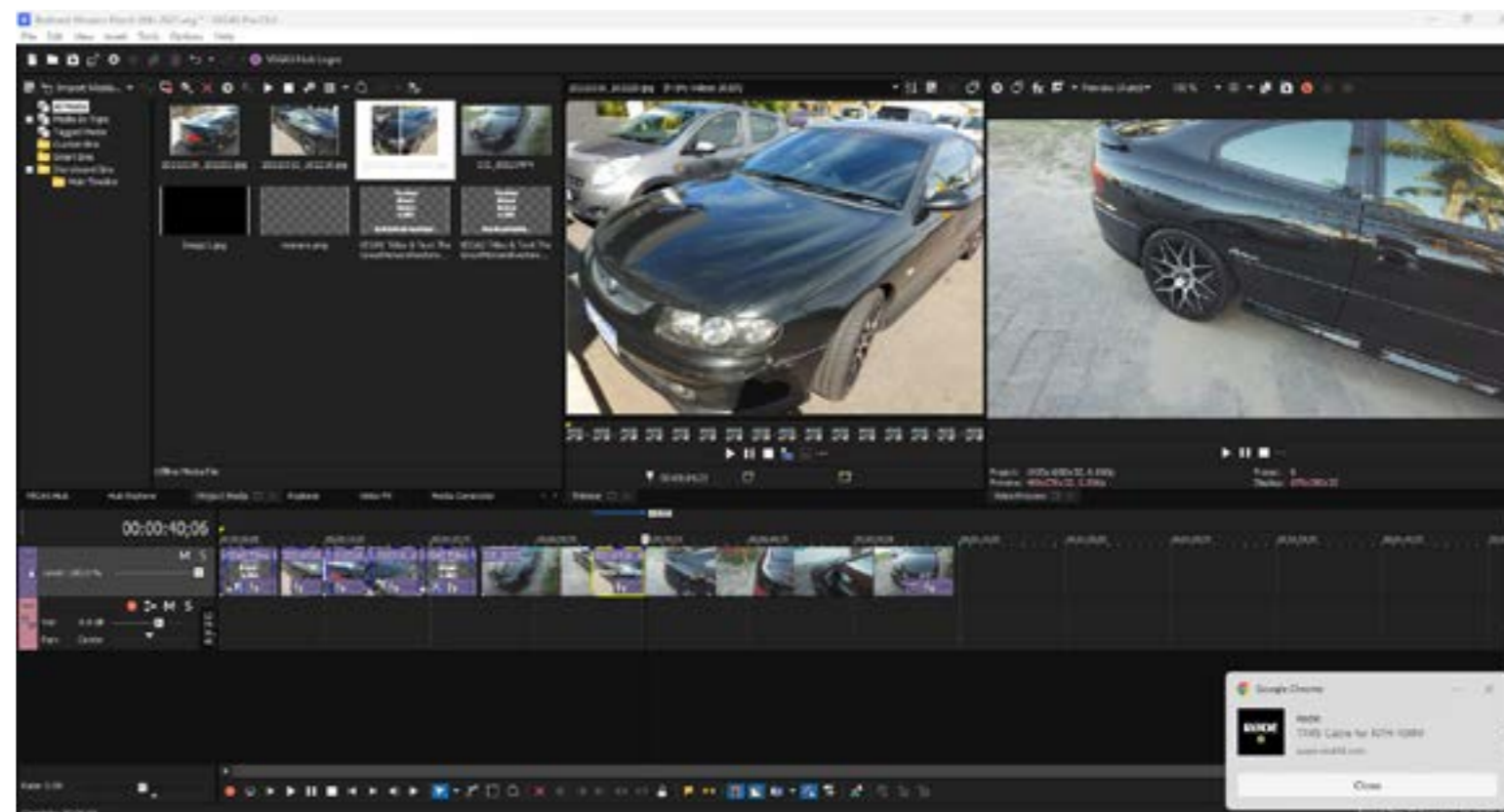
Vegas Pro is a fully featured Windows only video editor, but is very intuitive to use and easy to learn.

other order you like, or even insert or delete sections later.

Bin: A location in the NLE where you place all the assets to be used to make up the completed video. Assets conclude video clips (eg from your GoPro or drone), audio (from a music track or voice over), still images (eg photos) and graphics (titles or other things created in Adobe Photoshop, Corel Draw or any of a million other graphics applications). You can have many bins, for example, one for each type of asset, or one for locations or dates and times. How you store your assets and name your bins is up to you.

Edit: Simply the method of chopping up video clips (or audio clips) and reassembling selected bits in an order you want. You might also add a "music

bed" or a "voice over" dialogue once all the editing is done.

In Point: A location in a video clip to signify where the section you wish to extract will start. For example, if you a clip that starts at 0:00 and ends at 20:00, you might set an in point at 1:23

Out Point: A location in a video clip to signify where the section you wish to extract will end. In the same clip, you might set the out point at 2:13. These two together give you a clip of 0:50 to add to the timeline.

Timeline: The area where extracted clips plus graphics such as titles, still images etc are assembled into their final order.

Tracks: A timeline contains tracks.

Some editors have a limited number and others – the good ones like Resolve – have unlimited tracks. There are two types of tracks usually, video and audio. Audio tracks can be linked to video tracks (that is editing a video track will also edit its associated audio track) or unlinked. Unless you do some special processes once clips are on the timeline, called "compositing" the video on the top track will show in the playback window thus hiding all others.

Source Window: This is a window in the editor that shows your footage ready for chopping up.

Preview or Timeline Window: This shows the completed video as it is being assembled. It is a representation of the timeline.

Transition: An effect as you move from one clip or audio piece to the next when the video plays back. Common transitions are cut, fade, fade to black (or white) and cross dissolve. Be aware, fancy transitions are NOT to be encouraged as they detract from the story you are telling. For ex example, watch any Star Wars movie and 90% of the transitions are straight cuts.

SFX: Special effect. Like transitions should be used sparingly. Nothing screams "amateur" as much as a gazillion special effects (or indeed transition types).

How to edit

In very simple terms – and that is really all you need – a video clip is loaded into the source window from a bin and in and out points set to isolate a section of that clip so that can be added to the timeline. It's important to note that digital video editing like this is non-destructive. The original clip stays intact.

You continue to do this until you have selected all the sections of asset videos you want in the final video and have them in order on the timeline. Once this part is done (and after adding to the timeline in and out points can be fine-tuned even further), you can add transitions between the clips.

Be very aware of audio. Beginners in particular tend to think it is secondary to the vision, but nothing could be further from the truth. Hollywood spends a FORTUNE on getting the audio right for its movies. It's an interesting exercise to watch something like Saving Private Ryan, A Star Wars movie or similar big budget film with your eyes closed and

you'll see just how complex the audio can get.

Conversely, in my favourite film of all time (and classified by many critics as the best film EVER made), 2001: A Space Odyssey, the director Stanley Kubrick makes very skilful use of absolute silence for long stretches.

So make sure your audio, whether it be complimentary as a music bed, or a voice over, or even the raw audio from the footage itself is a part of the overall experience, and above all, necessary.

Finally, you might want to add some titles to explain a location, or a person's name for example. These are known as lower 3rds. Again, don't bombard the viewer with these as they are meant to add to the video, not overtake it!

Once you have ALL the assets assembled on the timeline in the right order, the story being told flows nicely, audio and video are in balance and there are no glitches such as tiny gaps, video out of synch with a person talking and so on, it is time to "render". This turns all the stuff onto the timeline into a proper video in a single clip.

There are a number of render formats, and inside any particular format, a myriad of parameters you can set. The good editing packages have presets you can use to save you learning all this guff at this stage. Many even have specific presets for YouTube, Facebook, TikTok and so on. Just choose the one that suits where you will be posting that video for public viewing.

If you are still unsure, you cannot go far wrong by selecting MP4 and

1920 x 1080p as the settings (except if you want vertical video which is a whole different ball game I'll get to in a later tutorial).

And that my friends are the very basics. I'll try and put together a complete walk-through video if there is demand for it. Let me know via the comments or email me at david@creativecontent.au.

At my website (creativecontent.au) I have a bunch of tutorials covering all things video and audio, but there are a pile of drone and specific ones if you are interested, and I also do a free regular e-magazine and podcast.

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"Once you have ALL the assets assembled on the timeline in the right order, the story being told flows nicely, audio and video are in balance and there are no glitches such as tiny gaps, video out of synch with a person talking and so on, it is time to "render""

SUBSCRIPTIONS?
NO THANKS!

BUT WAIT A MINUTE AND LET'S HAVE A LITTLE LATERAL THINK HERE...

BY
DAVID HAGUE

Although probably impossible to prove, it is more than likely the most popular and widely used NLE is Adobe Premiere Pro.

If you look through the various forums on video editing programs however, any number of people will tell you that they will not use it as they do not want to get roped into the Adobe eco-verse of subscription payments as against owning their software outright.

Fair enough. It's also fair to say that the way an NLE operates is very important to the way your personal workflow is setup. In my case, for more than 10 years I have been using Vegas Pro, and only recently switched to DaVinci Resolve for major projects. I still use Vegas Pro for quick and dirty stuff though as I can bang out a 30 second clip in just a few minutes.

But even the paid Studio version

of Resolve is incredible value for money for what it is capable of, especially if, as I do, you also get the Speed Editor editing console.

Before Vegas Pro I did use Premiere Pro though, and in fact its fair to say I learnt digital editing via that program, before that being mainly analogue based.

So, it is hard for me too to justify the Creative Cloud subscription for Premiere Pro at around 40 bucks a month. And if that is all there was in the "people versus Premiere Pro" argument pool, that would be the end of that.

But it isn't, is it? And this is the bit that more often than not is precluded from the Premiere Pro vs the rest subscription argument.

$40 a month for Premiere Pro as I say, I cannot justify. But $80 a month for a subscription that includes Photoshop, Illustrator and After Effects with InDesign thrown in I certainly could if I was a serious editor.

Sure, Bridge I would not use (Kyno is my app of choice for asset management) and Rush doesn't work on my mobile devices so there is a no point there either.

But to your serious video editor, Photoshop and After Effects are almost indispensable.

So my tip is certainly keep using the NLE of your choice. That really does not affect things in the greater scheme.

$79.99 per month (or $871 on an annual basis) I would have thought is an easy choice to make though for the benefits the other apps give you?

Of course, if you have never used Premiere Pro, you might turn out to be surprised how good it actually is. And the very tight integration between all of the Creative Cloud apps is an added bonus, being a great time saver as well as enabling a fantastic workflow.

If you have never used After Effects, then frankly, you do not know

what you are missing! You can get a trial of it and have a play. Grab some tutorials and run through them. While initially you may have NO idea what you are doing, you'll soon pick up the concept and probably think of a million things you could use it for and a few million more you COULD have used it for!

Get the trial After Effects here. And have a look at your first tutorial here.

TO THE SERIOUS VIDEO EDITOR, PHOTOSHOP AND AFTER EFFECTS ARE ALMOST INDISPENSABLE.

ARDUINO EXPLAINED

ELECTRONICS MADE EASY

ARDUINO UNO

The **Arduino UNO** is the "brains" of the Arduino system. It is basically an intelligent circuit board with inputs, outputs and the capability to process "sketches" which are the programs used to send commands to various components.

It can be powered by a simple 9v battery, an external charger (like those used by smartphones) or from the USB port of your computer.

In addition to the main **Arduino UNO** board, you can also plug in "shields", external boards that provide additional capacity further enhancing the capabilities and possibilities.

COMPONENTS

There are many types of electronic components, some of which you will be familiar such as an LED (Light Emitting Diode) and others you may never have heard of.

Common components used in the Arduino world include these LEDs of varying colour and types, resistors, switches, diodes, capacitors, transistors, motors, liquid crystal displays, potentiometers, sensors and so-called "chips" that perform specialist functions.

If you get the Arduino Starter Kit, the lessons take you through step by step introducing you to these components, what they do and where they can be used.
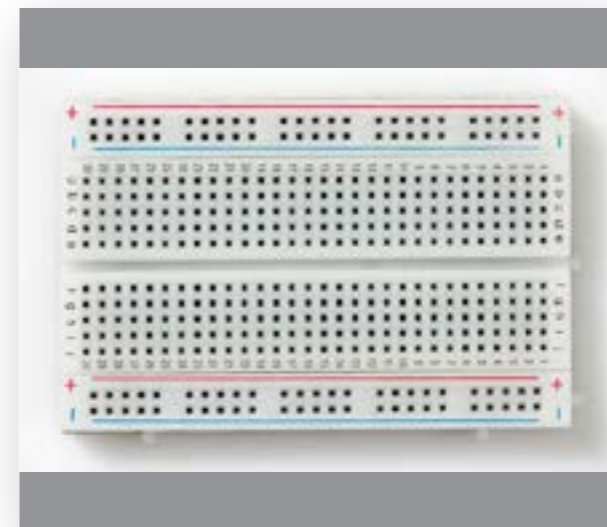

BREADBOARD

The breadboard is where the components are mounted and wired together to form a circuit. Power is supplied to the breadboard from the Arduino UNO and in turn, components are connected together on the breadboard or wired back from the breadboard to the Arduino Uno for processing, switching or other functions.

To make it easy, no soldering is necessary as each row and column of the breadboard is connected; you simply push the "legs" of a component into the holes and connect jumper wires to adjoining holes to connect them.

When following wiring diagrams, it is easy to know where to place the components on the breadboard as each row and column is labelled.
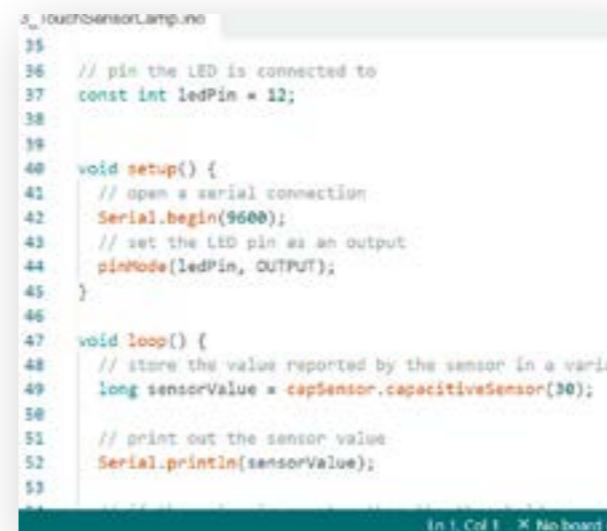
SKETCHES

Sketches are what Arduino call "programs".

Using the Arduino IDE, an intelligent editor that runs on your PC much like a word processor say, you build the various command lines of the sketch instructing the components what action to perform. For example, a line of a sketch might tell an LED to turn off at a certain point, or to flash "x"; number of times if a certain parameter is met.

You can get sketches to perform repetitive commands, open and close switches, check for certain conditions and much, much more.

3D PRINTING

BY DAVUID HAGUE

For those of us who own a 3D printer, I'll bet almost everyone has at some time printed a Dalek, Yoda, baby Yoda, dragon or similar. And we have shown these off to others to convince them that our purchase of said printer was somehow worthwhile.

In my case, I initially purchased my **Flashforge Adventurer 3** to print buildings etc for an HO model railway I have been slowly building over the years. My reasoning was that a genuine Hornby model – say a signaller's hut – could cost around £40 whereas I can download a model for free and print it for cents.

And so I have – warehouses, factories, apartments, railway platforms and buffers and other odds and sods that go to make up a scene in a model railway setup, saving hundreds of dollars in the process.

But I also found that my 3D printer could be used for other things.

Many filmmakers and editors will be familiar with **Maxon Cinema 4D**. It is right up there in the high echelon of 3D software used to create CGI in movies as well as build 3D scenes for shooting, saving untold amounts of money putting together the real thing.

I have been using **Cinema 4D** for over 20 years and whilst I will never say I am even close to being au fait with it, I can make it do what I want it to in most cases.

I doubt anyone – along with

Adobe After Effects – could ever intimately know the full toolset of **Cinema 4D**.

In my tinkering I have made replacement door handles, played around with substitute propellers for my DJI Mini 2 and Air2S drones, designed a sunshield for my tablet when being used as a drone flying viewport, made toys for my 15 month old grandchild and much more.

And then I got to thinking. What could I use the Adventurer 3 for in the film and photographic world?

And the dam wall broke.Without me designing a thing, I have found on a website called Thingiverse, all types of useful objects others have created and made available for download.

I have a mount for a GoPro (or any action cam using the ubiquitous GoPro twin finger mount) to go on a scuba mask, a pulley system using two 3D printed pieces and fishing line acting as a zip line to send a GoPro down, a mount for a DJI Pocket 2, various "shades" to go over LED lights to provide interesting shapes and shadows to lighting, a pair of mounts to hold a white card giving you an instant pseudo lightbox to get a neutral background or test white balance, a holder to keep AA and AAA batteries together inside my camera case, a phone stand, various brackets to secure cables and other things and much more.

There are also available stands to elevate such devices as the Loupedeck CT controller to a more comfortable level and I am sure anyone who had a little time to look around their studio

/ editing suite would find situations / devices that with a bit of time and patience a 3D printer could build and make easier or more comfortable to use or add some other convenience.

But you say, 3D printers are expensive.

Well yes, they used to be. When I purchased my Adventurer 3D 15 months ago it cost $899. (The Adventurer 3 by comparison allows models of 150mm x 150mm x 150mm). Different types of filaments can be used including PLA, PLA+ and ABS.

And it is only AUD$499 which is a bargain.

The only downside I have found so far in a small play is that while the printer stepper motors are quiet, the cooling fan is a tad noisy.

As an entry level unit, the Aquila X2 though is a great start. After you have exhausted its capabilities and learnt the nuances of 3D printing, you may then want to move up to something like the Creality CR-X giving you more filament types, speed and of course, a bigger build plate again.

For more flexibility, another option is the Snapmaker family that then also gives you CNC and engraving capabilities. Yet another, using resin to create models and therefore allowing much finer resolution – and favoured by those who relish in making miniatures for role playing – is the AnyCubic printer range.

All of these models can be seen at your local Jaycar store by the way, where in most cases, you'll be able to see them running.

If you have other interests apart from printing gadgets and gizmos for filmmaking etc, then the aforementioned website www.thingiverse.com has literally millions of models to choose from. Some donators require a small fee for their models, but many are free.

If you want to have a go at modelling yourself, you can download a trial version of Maxon's Cinema 4D (Mac and Windows) from **www.maxon.net**.

I HAVE FOUND ON A WEBSITE CALLED THINGIVERSE WITH THOUSANDS OF MODELS I CAN PRINT FOR FREE