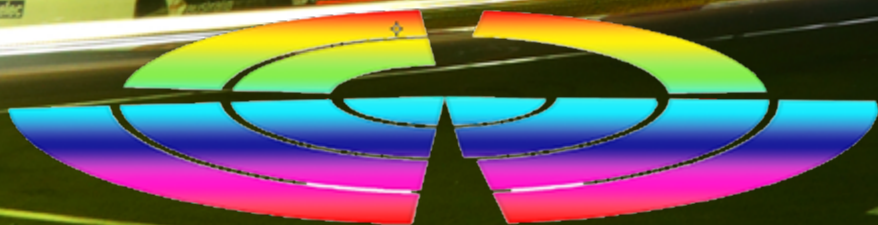EXCLUSIVE: BMD URSA Broadcast and Fujinon LA16x8BRM

Review: DaVinci Resolve 16.1 Keyboard

Review: DJI MAVIC Mini Drone (Part 1)

Audio for Action Cameras

Review: BENQ EX3203R Monitor

Cinema 4D Tutorial Section 1 Part 2

Australian Videocamera

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Cover Image (c) Ross Gibb Photography

Welcome to the latest edition of Australian Videocamera!

Not since Australian Videocamera went "digital" have we had an issue as big or as diverse as this one. There truly should be something for everyone in this latest Australian Videocamera.

The professional cammo I am sure will be more than interested in Dr David Smith's in-depth look at the Blackmagic Design URSA Broadcast camera married to an awesome new Fujinon lens specifically designed for URSA.

Editors I hope will find my look at single or dual monitor displays of interest, and also get an insight into what editing with a dedicated keyboard is like (and perhaps be tempted to also have a play with DaVinci Resolve as a consequence).

Denby Smith is back with his second in the Cinema 4D tutorial series, and now you really start to get your hands dirty building a "spaceport" in 3D space

For the action enthusiasts, we have a look at audio options for action cameras and also test drive the latest DJI drone, the MAVIC Mini. Finally, in a new segment we hope you will contribute to, I discuss what my shooting setup is and what gear I use.

*As always, if you have any suggestions, comments or criticisms, feel free to contact me via **david@auscamonline.com**.*

And don't forget as well as our website, we are also on Facebook, Twitter and Instagram! Just search for Australian Videocamera.

Until next month, happy shooting!

David

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EXCLUSIVE: Review Blackmagic Design URSA

PART I – URSA Broadcast camera

*S*ince its inception in 2001, Blackmagic Design has earned an enviable reputation for producing high-end digital movie cameras and associated studio hardware. They also released – in a surprise move – a fully featured non-linear editing suite called Da Vinci Resolve that sold for precisely nothing: it was free.

Paying for the full version added just a few crucial components that linked the software to the Blackmagic hardware elements but the free version is 95 percent complete. Several other companies have followed this lead, releasing either free or very cheap NLE software.

This is a fantastic move on their part and flies in the face of the detestable ransomware subscription model enforced by companies like Adobe.

No-one objects to paying a reasonable amount for their software – provided you get to own it – but having the software die when you can longer afford the subscription is frankly appalling. More power to the likes of *Blackmagic Design*.

Blackmagic Design cameras have always been distinctly innovative, taking heed of the requirements of professionals and integrating them into cameras that are not only great to use but remarkably affordable.

This is certainly the case with the newly released URSA Broadcast kit designed to take the best features of the original URSA range and stream-line them for ease of use and portability.

The result is a beautifully built camera body that retails for AUD$5,695 and can be matched to a wide range of 4K and Full HD lenses, but especially the *Fujinon LA16x8BR* reviewed here,

A Broadcast with Fujinon LA16X8 Zoom Lens

which was designed specifically as a partner for the URSA Broadcast.

I review

this lens separately but suffice to say the URSA/Fujinon combination is a real winner for both field and stu-

dio applications.

The URSA body is solidly constructed with nine 1/4" x20 screw sockets for attaching accessories such as monitors, lights and microphones. The camera has its own inbuilt stereo mics as well as XLR inputs for external microphones. There is a beautiful Full HD LCD touchscreen with razor sharp menu items that are clear and logically laid out.

When this screen is closed, well sealed with an O-ring to protect the various memory card slots, all critical shooting information is displayed on a bright LCD screen along with buttons and dials for all key functions including audio levels.

Outputs are via a 3G SDI socket at the front providing HD output for the viewfinder, studio or other monitors, and a 12G SDI terminal at the back providing a 4K signal suitable for re-

cording or input to a studio mixer.

One of the many brilliant design features of the URSA Broadcast is its flexibility and related affordability. Recording is to either CFast 2.0 or SD/UHS-II cards, both of which are readily available. CFast allows recording up to 4K Blackmagic RAW and ProRes, whereas SD/UHS-II cards are fine for Full HD and Ultra HD recording.

A 128GB CFast 2 card will set you back around AUD$550 whereas the same capacity SD/UHS-II card sells for around AUD$200. There are two slots for each type of card and, as always, the better and faster the card specs, the higher the supported resolution.

Similarly for lenses. The B4 lens mount allows you to use existing HD or UHD lenses although several optional lens mounts are available from Blackmagic so you can use a wide range of still camera and other video lenses. As

always it is important to check your own lenses carefully to ensure they will work well with the URSA's UHD sensor. Although many good quality HD lenses will resolve up to 2K or even 3K resolution, some lenses will show marked drop-offs in both chromatic and resolution performance when viewed in 4K as you move towards the corners of the frame.

Using the URSA Broadcast

This is a serious video camera and as such it is not a lightweight. With lens, viewfinder, microphone, battery and shoulder adapter the URSA broadcast weighs in at more than seven kilograms. You can hand-hold it but you need to be fit to do so for any extended period of time. My son Denby has used one of these to film football matches and, even though he works out, after two hours he really feels the strain. No problems on a tripod, though and likewise in a studio setting.

The LCD menu system is clear and logical and the LCD screen is crystal clear, even in daylight. The viewfinder can easily be adjusted fore and aft as well as laterally and there is a wide range of dioptre adjustment to suit your own eyes. For some reason the rubber eyecup was a bit prone to falling off. That may relate to this being a demo camera but I hope that wouldn't be the case with a new one.

With the Fujinon 16:1 zoom lens in place the camera is well balanced and all important controls fall easily to hand. After a couple of shoots I would feel totally at home with this camera.

I have just a couple of minor quibbles. The audio volume knobs on the left hand side are infinitely adjustable; I would definitely prefer the more usual calibrated ones so you can see your volume settings at a glance.

Given the kind of filming locations I often find myself in, including arid dusty landscapes and beaches with wind, sand and salt spray covering everything, I do worry about 4K cameras that have air vents on top and underneath the body. I appreciate that these systems inevitably get hot in use, so some kind of efficient ventilation is essential.

But the vents worry me: it would be near impossible to prevent sand, dust and rain dropping into these and I wonder what that would do to exposed internals and electronics. In wild conditions I normally use a rain jacket to protect the camera but would this prevent adequate airflow leading to overheating?

This is a vulnerability that I would want to address before taking this otherwise beautiful camera down to a surf beach in a storm surge. Perhaps air vents opening sideways and protected beneath a cover strip would be an improvement?

Blackmagic Design are continually improving the software and firmware for the camera and these updates can be accessed via the USB-C port.

PART II Fujinon LA16X8 zoom lens

No matter how good your image sensor, it will always be limited by the light rays presented to it, ie by the lens. I have loved high quality lenses since my childhood. My father and my uncle – who worked as a Kodak engineer in Melbourne – both took their stills photography very seriously. Both had German Exakta 35mm SLR cameras with their superb Carl Zeiss optics. Later, when filming my own documentaries, I used an Arriflex 16mm film camera with a beautiful Angenieux 20:1 zoom lens.

When I got the chance to review the *URSA Broadcast* kit I was as excited to try out the camera as I was to check out the Fujinon 16:1 zoom lens. Supplied with a 2/3" B4 bayonet which matches that on the URSA, the lens is designed as the perfect partner for the URSA Broadcast camera.

The one I am reviewing is the *LA16x-8BRM-XB1A*. This is a beautifully crafted lens with all of the important fea-

tures clearly labelled, well placed and delightful to use. The focus ring has just the right 'feel' and resistance for fine control, the zoom ring has a small lever which is useful and the aperture ring is placed right where you need it.

Geared rings are provided for either manual or servo-controlled follow focus, zoom and aperture.

The handgrip is well designed and has switches on top for Manual or Auto Iris as well as a Push Auto button. There's also a large variable zoom rocker handle, all of these switches being well positioned for effortless use during the challenges of real-world shooting.

On the underside of the handle is a Manual/Servo zoom selector and a very useful Flange Back Focus adjust-

ment button labelled Ff. Back Focus is achieved electronically and is faster and more precise than doing this manually. You press and hold the Ff button down for at least five seconds then release it. The lens will zoom in fully to your test chart. Adjust focus then press the button again. Now the lens will zoom out to full wide. Adjust the focus once more and you're done.

You can now zoom anywhere in the entire range and the lens will be sharply focused. It is crucial to perform this adjustment whenever a new lens is mounted and it's advisable to check Back Focus from time to time to ensure you have perfect focus throughout the entire zoom range.

This 16:1 zoom lens has a maximum aperture of just 1.9 at the widest zoom of 8mm (2.8 at 128mm)and is optimised for 4K capture. However, in combination with the **_URSA Broadcast_** camera, you will achieve excellent results in either Full HD or 4K mode. Interestingly, the URSA camera features a 1 inch sensor which makes critical focusing less risky when shooting 'on the fly' than with a full frame sensor.

A four-position wheel on the URSA offers three ND options, namely 2, 4

and 6 stops. There is no optical doubler available on the lens. One excellent feature of this lens is the simple Macro function, achieved by sliding the focus ring forwards in the direction of the arrow.

This reduces the Minimum Object Distance from 800mm to just 50mm making macro-cinematography easily achievable.

Conclusion

The **URSA Broadcast** kit with Fujinon 16:1 zoom lens is a cleverly designed, well implemented camera suitable for a wide variety of uses, from documentaries to ENG to studio productions. It offers great flexibility ranging from Full HD right through to RAW capture and with several custom made lens adaptors, allows you to use many of your current HD or DSLR lenses with great results.

The recommended Fujinon lens is superb and covers a useful range of focal lengths. It is a fast lens at f=1.9 at the widest zoom, ranging up to just f=2.8 at full telephoto.

Even more helpful is the inbuilt macro option. This is an excellent camera offering a wide range of professional features at a very competitive price.

Essential Accessories

Depending on how you plan to use the **URSA Broadcast**, there are many tailor-made options available to you.

You can easily use the basic URSA body with its excellent LCD screen and just the lens fitted, although the addition of a viewfinder, battery and plate, and shoulder mount kit are pretty much givens as essential accessories.

Here are the approximate costs although there are sure to be discounted options available soon.

- **Fujinon LA16x8** 16:1 zoom lens AUD$5,500 (ex GST)
- URSA Broadcast $5,695

- URSA Viewfinder AUD$2,449
- URSA Studio Viewfinder AUD$2,684

- URSA Mini Shoulder Kit AUD$500
- URSA Mini Microphone Mount AUD$200
- URSA VLock Battery Plate AUD$165
- Anton Bauer 90 V-mount battery AUD$495
- EF or PL lens mounts AUD$250 - $500

Total for basic studio/field kit approx. AUD$18,000

EDITOR'S NOTE:

We did check with Blackmagic Design regarding David Smith's concern about the cooling capabilities of the URSA Broadcast due to the design. We are assured by Blackmagic Design there has never been a problem even in locations and environments as diverse as the Amazon jungle and extreme desert heat. If a raincoat is added, there will also be no issues with cooling we are told.

Is a single widescreen monitor better than a twinned pair?

## *We tested a BENQ EX3203R to find out*

*L*ong ago in the distance past – the Moon might even have had water back then - I forked out, what was at the time, a formidable amount of cash to buy a pair of 14" LCD monitors. I then coughed up some more moolah for a pair of dedicated "swing arm" monitor stands to plonk 'em on.

I recall the total bill to be around the $1200 mark and the retailer in North Ryde was Very Happy and went out and ordered a Porsche.

I have had lots of monitors since then of course, as well as ginormous all-in-one screen computers from Dell; my current line-up is a 17" BENQ monitor married to an OSEE dedicated video monitor all nailed to a Dell desktop.

And it got me thinking.

Of course, as everyone who edits video specifically, or dabbles in other
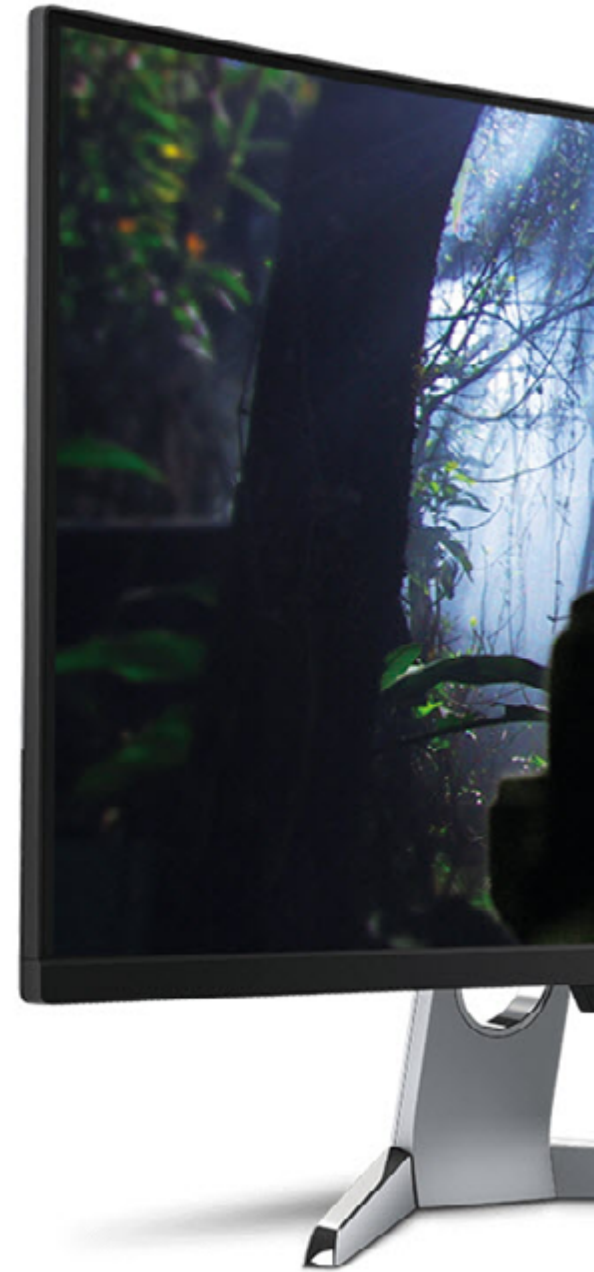
BENQ EX3203R Wi

creative pursuits using their PeeCee, the more screen real estate you can get the better, hence the dual monitor scenario. But these days, companies such as BENQ make widescreen monitors, usually marketed at the gaming types, so I wondered how one of these would go in the video editing world. And would the curved screen design be a help, hindrance or an immaterial factor in the editing process?

Also to be factored in, as well as screen real estate, was desk real estate. Two monitors with their feet takes up a lot of room.

I asked the nice folk at BENQ if they could find it in their hearts to lend me such a beast, and in a few days, a very nice **Model EX3203R** turned up on the Big Truck From The East.

BENQ describes this model thus: "(**The EX3203R** combines) HDR with B.I.+ Mode, which constitutes BenQ's exclusive technology, the details are brilliantly visible even while your eyes

are protected during gaming or video streaming."

Technically, the **EX3203R** is a 31.5" 2K QHD HDR monitor running at 144Hz with a curvature of 1800R (this is a fancy way of saying the radius is 1800mm and the ideal seating position is therefore also 1800mm from the monitor).

Setup was a snip. Incidentally, the box the **EX3203R** comes in has some of the cleverest packaging I have ever seen for a device like this, as a hinged system means you don't have to tip things upside down, fight with polystyrene versus cardboard friction or resort to the trusty Stanley knife and hacksaw combo as you do with many others. Simply cut through the sealing tape and the whole side of the box drops down letting pull the **EX3203R** out.

There are multiple HDMI, DisplayPort and USB-C ports letting you also plug in smart devices, Blu-ray players and of course, gaming consoles.

descreen Monitor

But my real interest was, as mentioned, in the **EX3203R** acting as an editing monitor. And one of the features that caught my eye – pardon the pun – was BENQ's statement that the EX3203R satisfied the global safety authority, TÜV Rheinland's certification for its flicker-free, low blue light and "Brightness Intelligence Plus" factors.

In short, they reckon you can use the **EX3203R** for extended periods, which of course while gamers do as we know, but so do video editors. This Is therefore very important.

And they were right. In a very extended session of editing for a mate who is a branch Pres of one of this State's Ulysses Motor Cycle Clubs, unlike other monitors, I ended without a massive headache, despite the screen being slightly brighter than I would have normally.

Apparently, there is a sensor built into the **EX3203R** that detects ambient light levels and colour temperature of the environment and adjusts the screen automagically accordingly.

Brilliant!

And I also have to say the quality of the imagery, especially HDR based stuff is superb. With HDR now such an important part of editing, this technology in your monitor is – or indeed has – become a necessity. And while it is not strictly speaking a 4K monitor, but more like 2,5K, the frame rate capability is pretty damn good in compensation.

Now listen up here for a minute as this is important.

Recently I have banged on about er-

So, while at $750 or so the **EX3203R** is not inexpensive when it comes to basic monitors, the value lies in much more than pretty pictures in my opinion. That is, this is NOT a basic $169 monitor, not by a long shot.

And bang for buck on a quick look, the **EX3203R** is better than its opposition products such as those from ASUS.

Okay, if you are a top of the range, dyed in the wool colour correction expert video editor, you'll go way beyond the BENQ **EX3203R** into the realms of the OSEE range for example (and B**ENQ make one too just quietly)**, but for your everyday editor who also likes to play a few minutes of Call of Duty or Project Cars on occasion, and wants a great monitor with plenty of screen real estate for video editing, the BENQ **EX3203R** would be high on my list.

Oh and yeah, as a bonus it frees up a lot of physical desk space too.

gonomics with regard to keyboards and mice etc, but also of paramount importance is of course eyesight. As the years pass you by, you definitely notice a degradation of eyesight, so I reckon there is little sense in accelerating the process by having crap habits and tools to go with 'em.

In the 70s no-one told us about danger to the eyes from the harsh glare of the Pilbara or Kimberley sun, and now an entire generation is paying the price. The same goes for the current generation who are staring at screens all day as against squinting in bright daylight.

$1600 for a keyboard? It'd better be d

*D*ouglas Adams once said, *"Space is big. No REALLY big".* (If you are a youngling, look up the "Hitchhikers' Guide to the Galaxy". You're welcome.)

And so, to paraphrase, the Blackmagic Design Da Vinci Resolve 16 keyboard is big. No, REALLY big.

The photo shows it next to a bog-standard Dell keyboard and you can see what I mean.

Made of Steel

But there ain't no flimsy plastic, string and elastic bands nailing it all together in this baby. The Da Vinci Keyboard (I'll abbreviate this to DVK from now on) is all metal to start with (and weighs accordingly) and Blackmagic suggests the keys are good for over 1 million operations each.

Importantly, and I would suggest almost most probably uniquely, is that all components are available as

spare parts giving the DVK an unlimited life-span.

Mind you, at AUD$1600+, you would

lamn good. (Hint, it is)

by David Hague

in reducing fatigue – *a subject very close to my heart right now of course.*

Sculptured Keys

I love the sculptured keys as against the more normally flat ones in use today. They remind me very much of what I consider the very best keyboard I have ever used, that from the ill-fated *Tandy Model 2000* in the 80s.

I have owned a LogicKey Vegas keyboard for about 15 years now and like it very much indeed. But at the end of the day it is a standard QWERTY keyboard with keys that relate to shortcut commands colour coded accordingly.

The DVK on the other hand goes way beyond this, and Jacqui (my partner who happens to be a keyboard wizard of the musical kind and a *LogicPro*

never treat or expect it to be a throw away item.

One thing I do like, especially considering my current wrist affliction is that there is a soft touch hand rest aiding

Jog Wheel / Controller

As you can see, there is an integrated jog wheel-cum-controller and this is machined from a single piece of metal giving extraordinary control for jogging and trimming. To assist, the jog/controller has a built-in electronic clutch and multiple roller bearings giving extremely smooth scrolling forwards and backwards.

My only point of reference here again is my well used and loved *Contour ShuttlePro 2,* and as good as this is, there is absolutely no comparison.

The only criticism I have of the jog shuttle controller is that it is on the right of the DVK, as I prefer it left hand based (even though I am right-handed) as this means I can mouse and shuttle at the same time. This is largely offset by the functionality of the keyboard itself though, as you can use your right hand to control the position in a clip being edited, and the left hand to perform actions using the colour coded short cut (and other) keys.

for the Mac aficionado) summed it up nicely. You see, the DVK is not just a keyboard. No, Jacqui said, it is a workstation in its own right.

As well as the standard QWERTY and Function keys, Blackmagic has designed it with dedicated keys for specialist tasks including in and out, close up, roll trans and so on. In this sense it is akin to the Contour ShuttlePro 2's buttons that can be programmed for certain tasks away from the main keyboard, but the DVK is at a whole new level in this area.

Two of these "other" keys are Source and Timeline. The Source key instantly creates a virtual "source tape" of all the clips in the bin in the current project and using this button, you can simply scroll up and down all your media meaning you do not need to navigate potentially thousands of clips.

The clip being viewed is also highlighted in the bin in real time and as a bonus. switching between the source tape and timeline is immediate. You can also instantly resort all the clips in the bin based on parameters such as time, camera, duration and name.

The sheer size of the controller means that trimming is very precise and accurate and thoughtfully, there are transition buttons allowing you to switch between cuts and dissolves instantly.

The workflow to get the best means you may have to modify what you are used to, but the combination of move, mark in, mark out, apply edit and move again is a very fast way to work indeed.

The other innovations in the DVK layout and extra key functionality will, I promise, revolutionise the way you edit.

There's A Catch?

Is there a catch? Well yes, sort of. But it isn't a bad one by any stretch.

The DVK is designed specifically to work with Da Vinci Resolve version 16.1 (or presumably any later versions) so if you are currently an AVID Composer, Vegas Pro, Grass Valley EDIUS, Adobe Premiere Pro, FCPX or other NLE jockey and have no intention to change that state of affairs, then save your pennies.

But I strongly urge you, if you haven't already, to download Da Vinci Resolve 16.1 (you can get it for Windows, Mac and LINUX) and have a look. This is no pretend NLE I promise you, and as you may have heard, the colour grading capabilities alone are worth the price.

Except for the majority of users, there is no price, as the software is free (as is its sibling, Fusion, but that's another story)

Conclusion

Da Vinci Resolve 16.1 is an awesome editor. Throw the Da Vinci Resolve keyboard into the mix and it becomes, for the professional, in my opinion an almost unbeatable combination. Add Fusion and it is one hell of a system.

All for the price of a 2-year subscription alone to other NLE software.

And you still get not just a keyboard, but almost a work of art to boot.

To get full details on the feature set of the Blackmagic Design DaVinci Resolve keyboard, see *https://www.blackmagicdesign.com/au/products/davinciresolve/keyboard*

FUJIFILM
Value from Innovation

Blackmagicdesign

2/3" PROFESSIONAL LENS 4K
LA16x8BRM

MAIN FEATURES:

- Designed for Blackmagic URSA Broadcast: Provides the best lens performance for Blackmagic URSA Broadcast with 4K and HD resolution.

- Compact and lightweight with 4K resolution: The lens weighs approx. 1.6kg thanks in part due to its unique a rear focus mechanism design.

- Electronic flange back adjustment with macro switch function: This new function increase convenience when shooting.

- Compact/lightweight and 4K resolution.

- Electronic flange back adjustment function.

- Macro function.

- Handheld or EFP/Studio style.

Product specifications are subject to change without notice. NOVEMBER2019

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FUJINON

Show Me Yours ...

by David Hague

*T*his is a brand new section in which each month we'll try and bring you a story from a Australian Videocamera reader on what equipment they use and why they chose it., To start the ball rolling I have volunteered myself ...

Camera Equipment:

My day-to-day gear is based mostly around **Panasonic** camcorders, and which one I use is dependent on what I am shooting at the time. Many shooters stick inside a single discipline – docco, news, sport etc – but I get called to shoot various jobs and of course, we do lots of testing of peripheral equipment. Because of this I can switch between an **HC-WFX1** to an **HC-PV100** or **HC-X1** on a regular basis.

The **WFX1** is used primarily for on the go sporting events (motor sport primarily) as it is small, light, unobtrusive and easy to carry around. And of course 4K

The **PV100** has also been used for sport where I need it to be tripod mounted (a lightweight Velbon) or locked off, leaving me free to roam with the **WFX1** for interviews and the like. I have also used it on shoots for whale watching (in concert with a GoPro Karma drone) and general fishing shoots as the stabilisation is excellent for on-water use. Usually in these it is acting as a primary camera in partnership with a Sony

RX0, or a GoPro 5 or 7 (My Go-Pro 6 is in the Karma Drone) getting the action / in-water shots.

When I need to do a job that requires "serious" 4K work – usually interviews or events (presentations) or when I make talking head tutorials, I use the HC-X1 mounted on a Manfrotto tripod.

Audio:

The **HC-PV100** and **HC-X1** share a **Sennheiser MKE600** between them, or for interview work, a **Sennheiser XSW-D Lav se**t (which when using the WFX1 for sporting interviews in-the-field is also brought into the game). For my own stuff – the tutorials – I prefer to use either the XSW-

...D although I have also used my **Sennheiser Memory Mic** system in conjunction with my Samsung 7 phone (no, not the catchy-firey version!).

For monitoring, a pair of **Sennheiser HD300 Pro** cans are used.

Lighting:

My lighting requirements are very basic thankfully. The PV100 has a built in LED lighting system which suffices for most purposes I need. If I do need a light on either the WFX1 or X1, I use a simple Aputure A1M9 LED system.

VR/360°:

Frankly which I use here depends on my mood! I like the **Vuze** and **QooCam** as they both come with their own desktop software for pre-preparation of the sub-sequent files for serious editing in **Vegas Pro 17** as well as Android apps to control them. Similarly, the Ricoh Theta has an app but has no desktop software - but I do like the imagery it produces. I have had a 360Fly for a number of years, but these days it is rarely used if I am honest, as the others are superior in my opinion. I would like one that is water resistant I admit (again for fishing expeditions) as the waterproof housings for any of them are horrifically expensive.

Other:

Very occasionally I use add on filters (outside of ND filters that is) for something specific and use a Cokin kit with adaptors for each of the three video cameras and for a **Canon 5D MK II.** I have a 3rd party set of colour filters and grads I bought through e-bay for this purpose, mainly to mimic Top Gear style backgrounds when I went through a "phase".

For stable work, at this point I use a **GoPro 7** mounted on a **GoPro** Karma handheld gimbal, but I admit in testing, did like the newer DJI gimbals and especially the Pocket Camera (despite its silly registration system!) with its built in gimbal system.

A selection of Joby tripods is in the Turtle case and a "secret weapon" I found years ago in Vanuatu of all places, a G-Clamp doubles as a tripod with a Manfrotto-like head which is ideal for awkward spots, especially clamping to the side of a boat to get a vertical shot straight down into the drink!

For so-called action camera work, I have
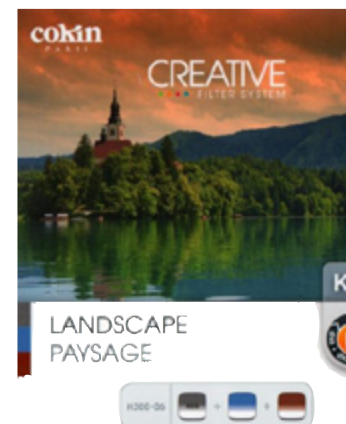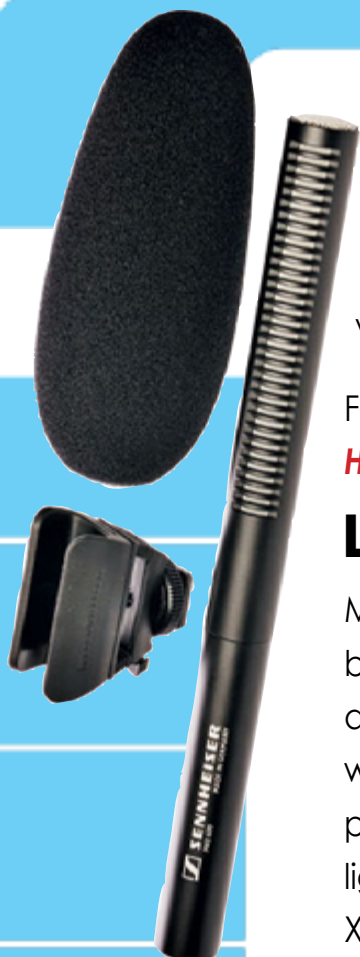
a selection of mounts purchased mainly via e-bay to mount GoPros and others on to anything from a fishing rod to the rear wing of my Monaro, windscreens, boat rails, hats, chest mounts and even one for SnorkyThe-Dog!

A specialist mount from UK based **Hague Camera Mounts** (no relation I assure you) is used for car mounting via a huge suction system and another from Hague mounts to seat head restraints.
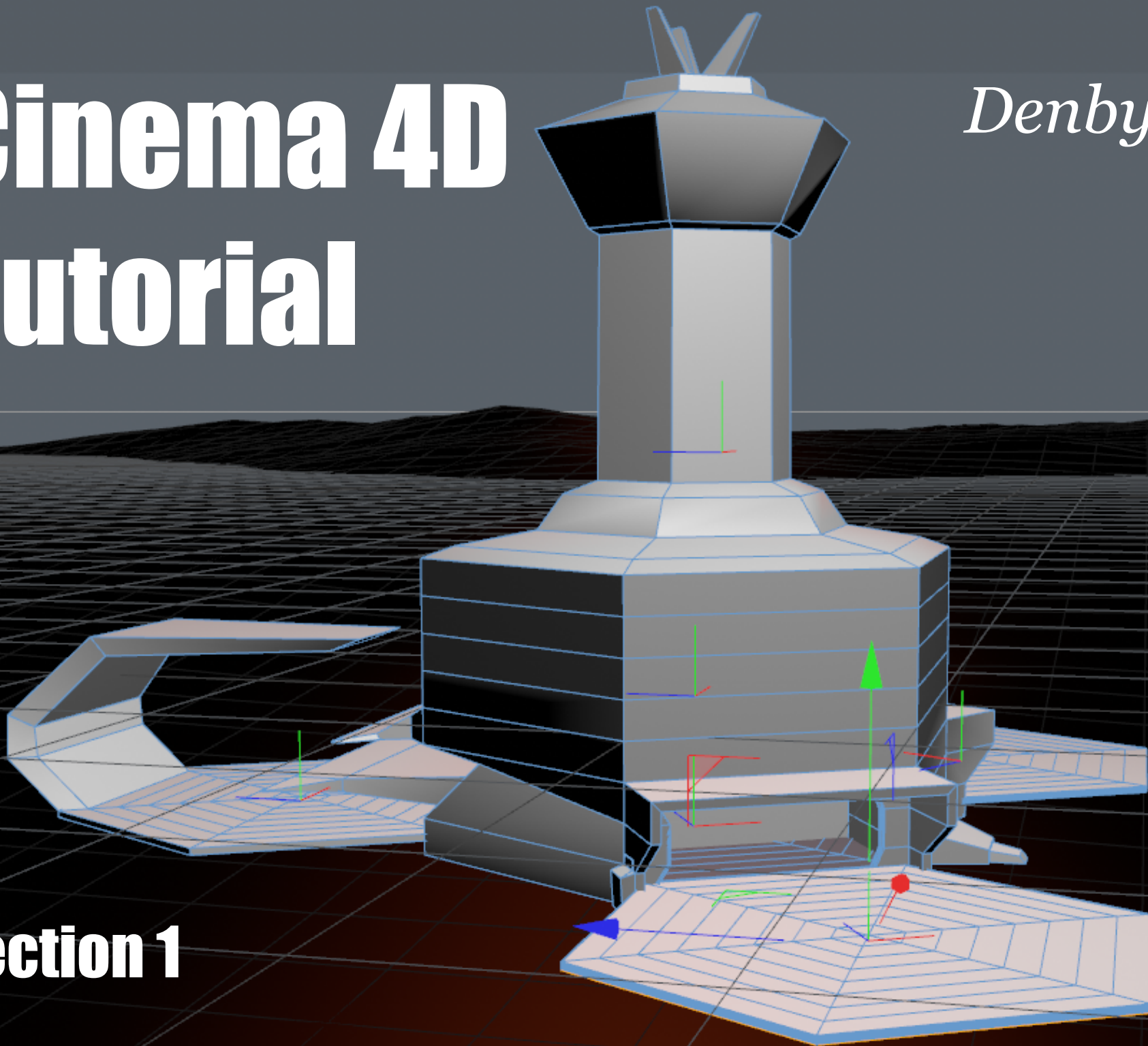
Conclusion:

So, there you have it.

This collection has been built up over the last 20 years, but I freely admit, despite the diversity of equipment, like you, I am sure, there is always some desirable piece of kit I still want!

I just haven't seen it this week as yet

Cinema 4D Tutorial

Denby Smith

Section 1

Parametric modelling, tools and techniques for creating scene assets.

Welcome back. I hope you had some success toying around with what we learned last time and I imagine you started figuring out a few other things too.

Great, because now we have some work to do.

Now thinking about our sci-fi scene, we need to create a collection of assets which we will bring into our main scene when we create it later. To begin with, we need some structures;

Some kind of habitat, a space port, communication tower, somewhere for ships to dock. The habitat seems like a good place to start.

Now, here's the hot tip! Go to town creating things, getting inspired and making even more things.

But, all good 3D work starts off the old-fashioned way... Paper and pencil.

You've got to have a plan. It helps you stay on track and eliminates a lot of the back and forth involved in making ground level creative decisions which, when working in 3d, adds up to a lot of wasted and unsatisfying time.

Ultimately, you want to reserve that energy and channel it into the really interesting creative decisions down the track as your work begins to take shape.

1. Habitat sketch showing zoom out view of both
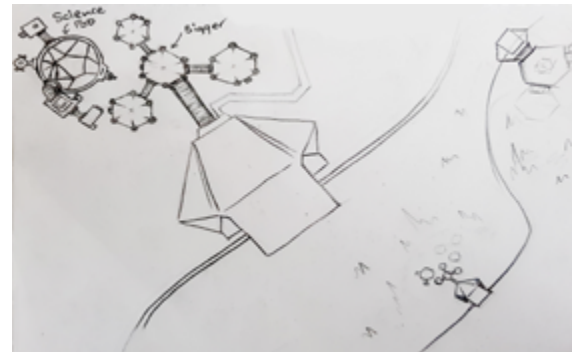
2. Spaceport sketch
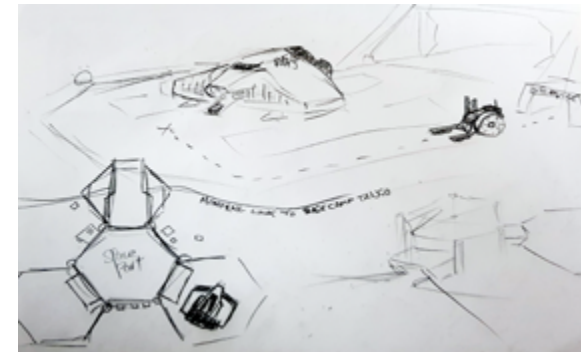
So, I sketched up some ideas, reshuffled a few things and came up with this, a fairly simple hexagonal concept.

One of the things I love about modelling in 3D is how simple it is to copy/paste geometry so by using this repeated shape it means that we can reuse a lot of what we do to make a bigger, more complex scene without giving ourselves too much extra work.

That said, I decided to have separate spaceport and habitat areas linked

by a kind of monorail, so we can add some animation later on. So, this is what I'll be working on throughout the series, but as you gain skills and confidence you will add your own ideas, creating your unique world.

OK let's get started building our structure, the first component is the hexagon. Create an 'Oil Tank' from the 'Primitives' menu and go down to the attributes panel and under the 'Object' tab reduce the amount of 'Rotation Segments' to 6 giving us a nice hexagonal shape.

3a.Oil Tank with 32 Rotation Segments
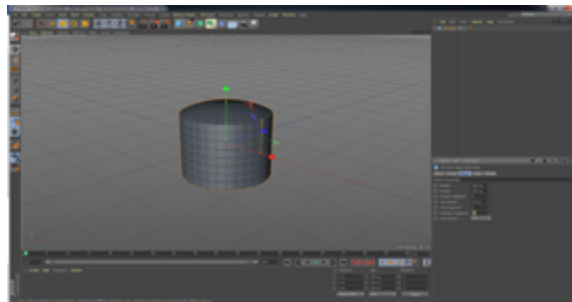
3b.Oil Tank with 6 Rotation Segments
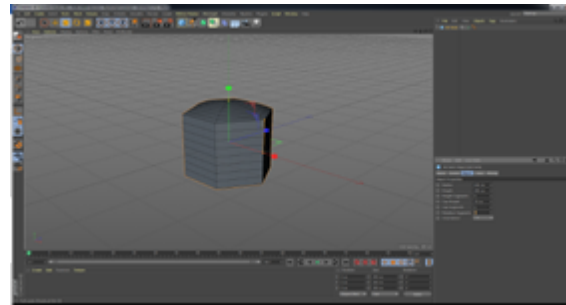
Make the Object editable and scale down the 'Y' axis so looks a bit flatter.

4a.Adding Multiple Oil Tanks
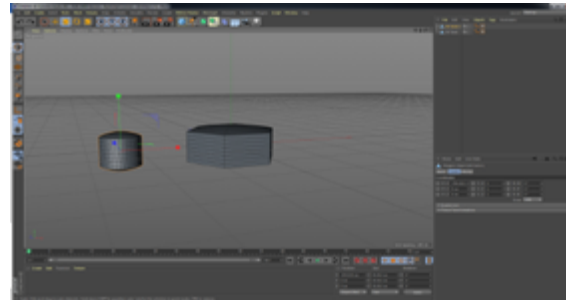
4b.Scaling Oil Tank
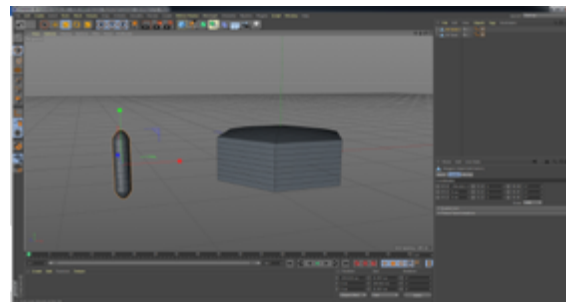
Now create another Oil Tank, move it to the side, make it editable and scale up the 'Y' axis so it becomes long and thin. Then to scale the object down on all axis, just click anywhere on the screen and drag down until it's roughly the same height as the hexagon.

You can compare the heights of each object using the Coordinate panel. Set it to '*Object (Rel)*' note an object's '*Size*' value in the '*Y*' dialogue, then do the same with the other. Now go up to the '*Cameras*' menu and select '*Top*'. Now we can see a flat 2d image of our workspace viewed from above.

5a.using the Top View
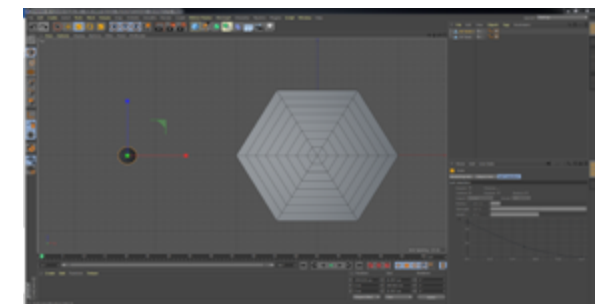
5b.Lining up by eye with grid lines

6b.Placing objects

7a.Selecting multiple instances
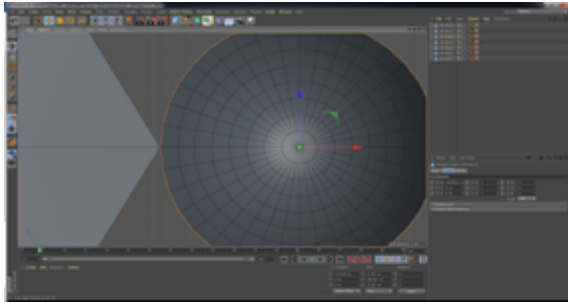
Using this and the side views can be really helpful when you are trying to be accurate. In this view you cannot move in 3D so use pan and zoom. Move the small Object over until it touches the corner of the Hex object then hold CTRL and move the copy up and to the right, aligning it with the next corner. Repeat this for all corners using the grid and geometry lines to help line things up.

6a.Copy Pasting objects
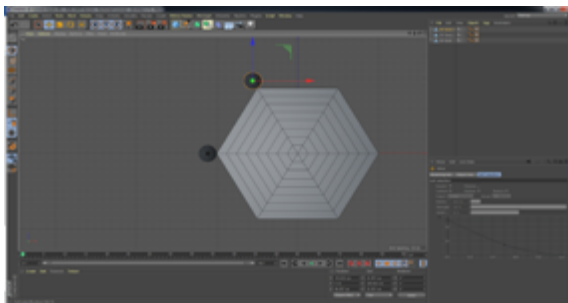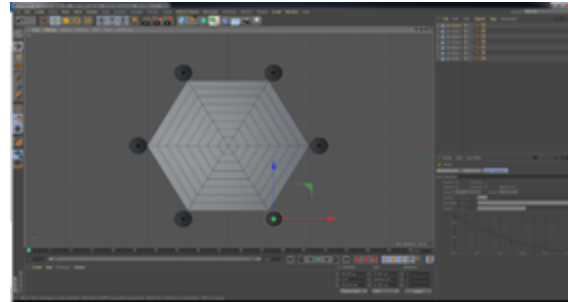
Now go back to the '*Perspective*' camera view and have a look.

Now is probably a good time to start naming the objects in our scene, as you can see the '*Object*' panel is filling up with Oil Tanks 1-6 which is not really helpful.

Double click on the lowest Oil Tank in the list, the first one we created, and name it whatever will make sense to you, I'll just name mine '*Main*'.

With the others I don't think we will need individual access anymore so let's combine them into one by selecting them all, right clicking and selecting '*Connect Objects + Delete*'.

7b.Using 'Connect Objects + Delete'

We can still edit them as normal, but we have saved a little real estate and made things a bit clearer. Now rename this '*Columns*'. Lastly let's cut off the bases of the columns so that they sit flush with the base of the hexagonal object.

In '*Polygon*' mode use the rectangle

selection tool to select all the faces making up the curve at the bottom of each column and delete. Choose '*Select*' from the main menu and go down to '*Loop selection*'. In '*Edge*' mode, select the perimeter edge at the base of one of the columns and see how all the connected edges are selected too, Loop and Ring select are great tools. From the '*Mesh*' menu go to '*Create Tools*' and select '*Close Polygon Hole*'. Hover over the '*Edge*' until the hole highlights and click.

This creates a new polygon face connected to the unattached edges, completing the object boundary.

8a. Using Loop select
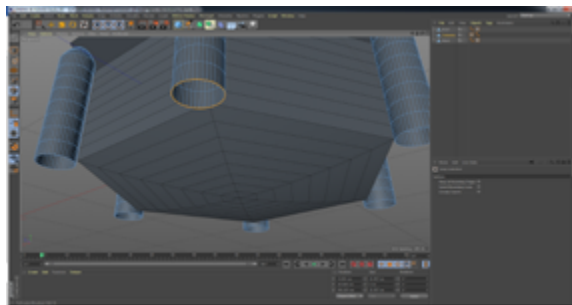
8b. Closing Polygon Holes
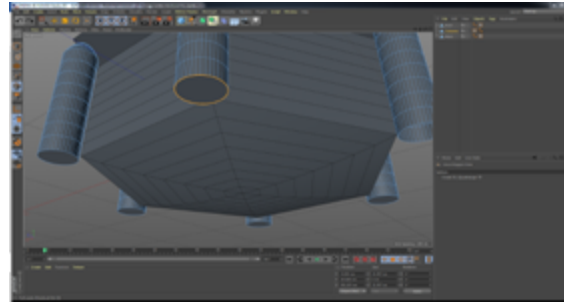
OK, so let's get a bit fancy. Choose the '*Live Select*' tool located next to '*Move*' and just click and drag to select all the faces on the top of the hex object.

This is a great tool but always be sure you have a good view of what you are selecting so as not to select any unwanted geometry. This becomes increasingly important with complex geometry. If you do select something you don't want, you can just hold CTRL and deselect it, then continue to '*Live Select*' by holding SHIFT. Pretty standard selection stuff.

9a. Copying section of geometry
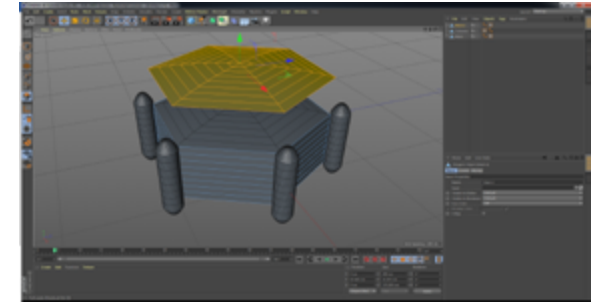
9b. Selecting and Deleting excess geometry
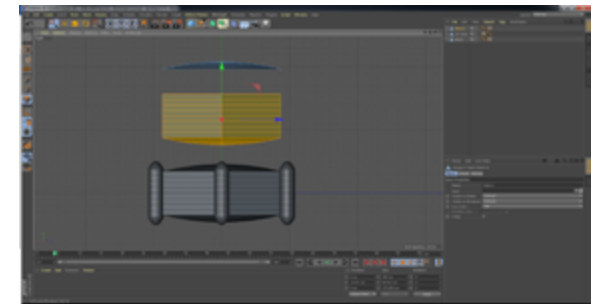
With all the top faces selected, copy and paste then move up it in the '*Y*' axis. Now we have a copy of the roof section. But there is an unseen problem. If we go into '*Object*' mode now and drag the roof further upward, you can see the rest of the Oil Tank is still connected.

Drag it right up until you can see the

whole object. Now go up to the select tool, click and hold to see more options. Choose '*Rectangle Selection*' and go to the camera menu and choose a side view, Right, Left, Front or Back any will do and drag the marque around the bottom section of our copied Oil Tank. Hit Delete.

One issue we have is that our objects '*Local*' pivot point is still at the original position, so we have to fix this now. Over on the left toolbar below '*Polygons*' selection mode is the '*Axis* Modification' tool which allows us to reposition our pivot point. Click to enable it, then drag the '*Y*' axis handle up to the center of the Roof object.

Now it is vitally important to disable '*Axis Modification*' immediately after performing this action. Otherwise you will modify axes all over the place and wind up very confused. Now, rename it '*Roof*'.

Back in '*Perspective*' view move the roof down to the height of the top of

the columns and scale it up slightly so the corner tips overhang the peaks of the columns. This might look ok however the roof section is actually only a one-sided '*Plane*' and not a complete polygonal object.

In some cases, you can use one sided '*Planes*' but that's a story for another time. There are many ways to deal with this, but let's just go with the quickest easiest (cheapest) solution for now by closing polygon holes, like we did earlier.

This time however we won't bother with '*loop select*' as the tool automatically recognizes unattached edges causing holes. Just go to '*Mesh' > 'Create Tools' > 'Close Polygon Hole*' and hover over the '*Edge*' until the hole highlights and click.

Great work, you have now made a custom piece of geometry.

And begun work on the first asset in your Sci-Fi scene. Kinda reminds me of a certain slug like character's pal-
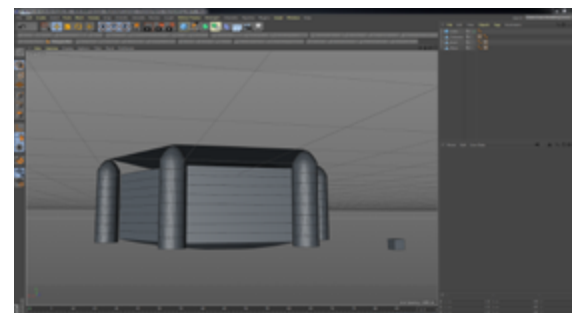
ace, from a film… far far away.

Now let's get the scale right before we turn it into something more substantial. Create a cube, set its size to 1meter and place it next to the building. As you can see, at this point our building is a little on the small side so scale it up by around 500.

***10a. Using 1m cube to check scale***
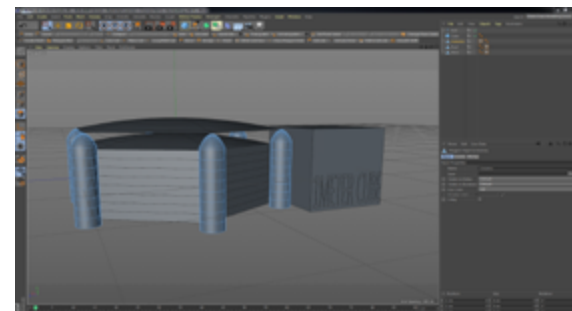

10b. Scale up x500

That's better, now we need to create the tunnel that connects the modules of our habitat. Zoom in to get a good look at one of the outer walls and using '*Polygon*' mode, select 3 faces of the lower part of the wall, I chose to leave the very lowest face unselected so the tunnel is raised off the ground but that's up to you. Go up and select '*Mesh'> 'Create Tools' > 'Line Cut*' then, by clicking to create points, draw out a shape within the selected faces, remembering to close the shape by ending on the first point.

11. Line cut tool
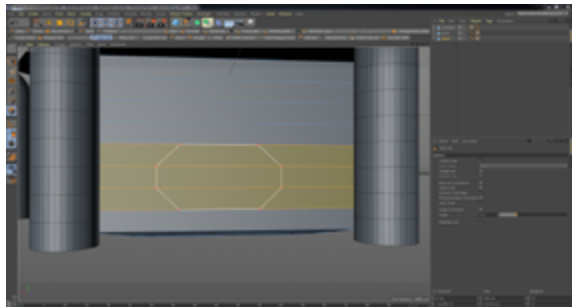
12. Extrude Inner tool
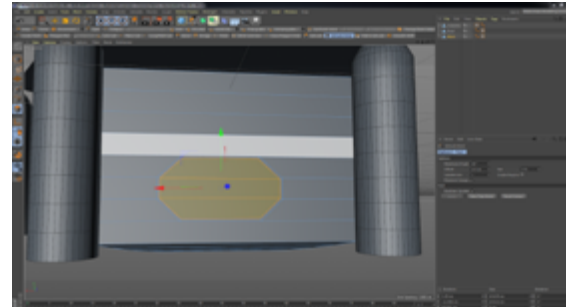
With the faces inside the new shape selected, go up to '*Mesh > 'Create Tools'> Extrude Inner*' and hovering over the selection, click and drag the mouse just the slightest bit to the left. Now, again select the inside faces and this time choose '*Mesh > 'Create Tools' > Extrude*' and drag the mouse to the right. This new geometry will become our tunnel.
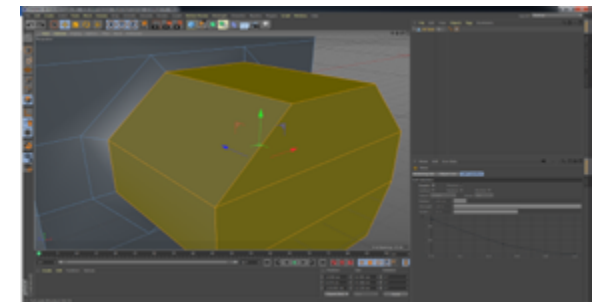
13. Extrude tool
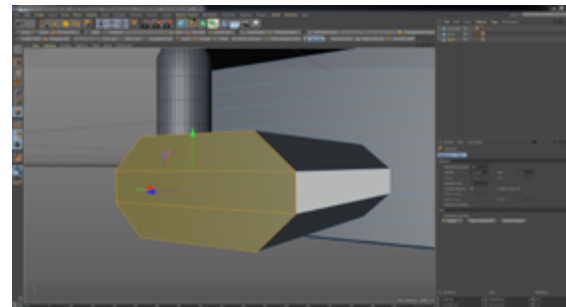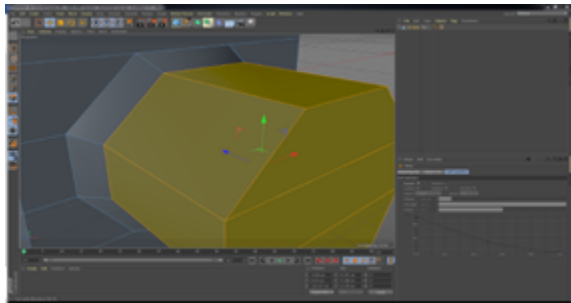

14. Select new tunnel section
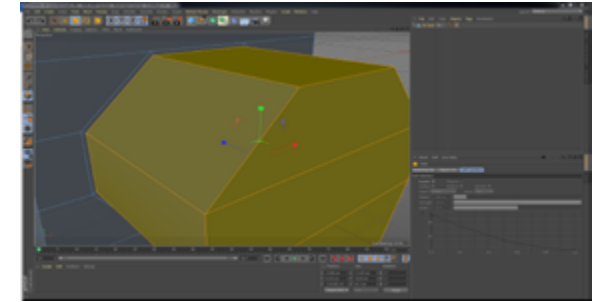
Before we move on though we need to tweak where the tunnel joins the wall. So, select all the faces of the new tunnel section and scale it down a little on all axes, then move it out along the Z axis. Much better.

### 15. Scale down tunnel section

### 16. Move tunnel along X axis to complete joining section.

Now on the other end of the tunnel we are going to do it a little differently. Select the end faces then go up to *Mesh > Create Tools > Bevel*, (depending where you click the mouse, you can get very different, very strange results with this tool) so hover over one of the edge lines until it highlights. This step involves two mouse moves, first click on the highlighted edge line and drag along the X axis, then using the mouse wheel scroll up along the Y axis, creating a nice bevel just like our first one.

17. Select end faces
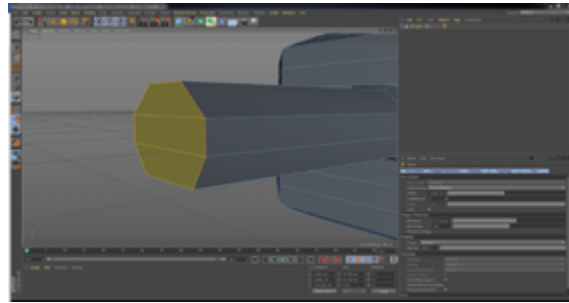

18. Bevel tool
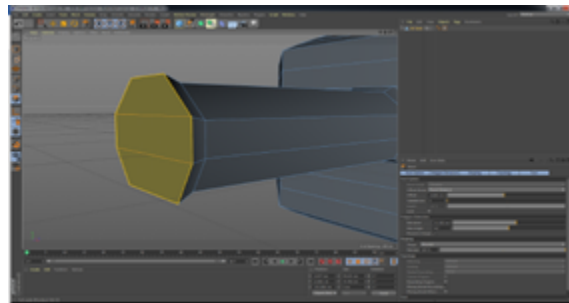
OK. Now we are ready to expand this hexagonal lollypop into a functional off-world Habitat Complex. Use the 'Top' view again for this process. Select the whole object and create two copies by either using *Ctrl+ C & Ctrl+ V* or click and drag while holding down Ctrl and place one either side of the original and scale them down, about 70% should do.

19. copy objects
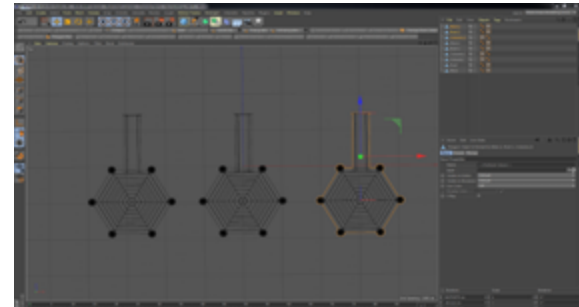
20. Scale down objects
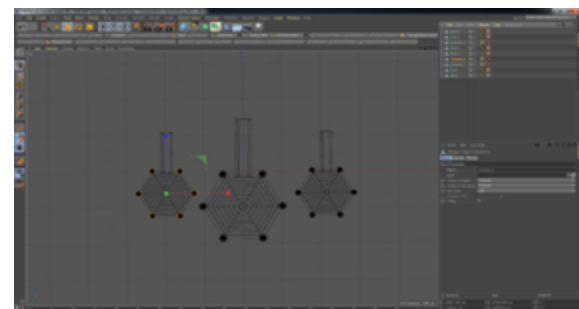
This will indicate the original hexagon is the main building and give it some dominance. Now we need to use '*Rotate' and 'Move*' to position them, so the end of the tunnel section appears to connect with the corresponding wall, of course if we were intending to add interior shots to our animation we would have to weld these section together properly, how-

ever as we are only looking for exterior shots we just need to make sure there are no visible gaps between the meshes. Because we are using a six-sided hexagonal shape, rotations are easily calculated, so select the left-hand object and instead of using the rotate tool, go over to the '*Attribute*' panel and in the '*coord*' tab type -120 (minus 120 degrees) into the top dialogue box in the rotate column (R.H).

Next go over to the '*Selection Modes*' toolbar, click and hold the magnet icon or '*Snap*' tool. From the flyout menu click '*Enable Snap*' then also select '*Polygon Snap*'. Ensure you have the end faces of the tunnel selected and drag toward the wall until its snap up against it you may want to change view back to '*Perspective*' while doing this as it can be tricky to get a good eyeline.

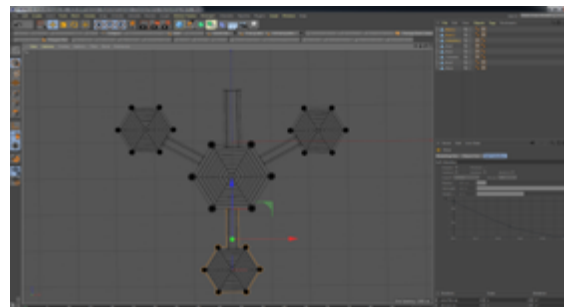Repeat with the right-hand object, remembering to rotate by positive value of 120 this time. Finally make one more copy and, sans rotation, repeat the process for the lower section to complete the structure.

Now back to perspective view and have a look at your work!

21. Rotate +/- 120 degrees.
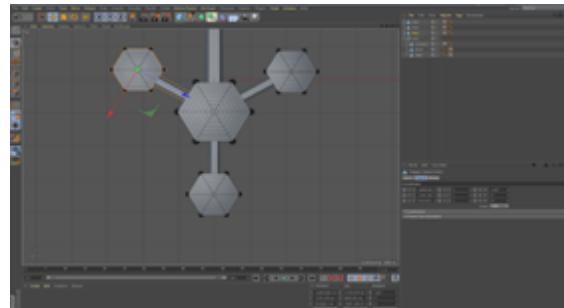
22. Use Polygon Snapping to align objects

Tip: It can often be necessary, particularly in cases such as this where our objects are positioned diagonally, to change the orientation of a polygonal objects center axis or pivot point. This is easily done by selecting the '*Axis Modification*' tool from the '*Selection Modes*' menu on the left. Simply click to enable, then use the usual '*Move*' and '*Rotation*' tools to adjust to your needs. Be sure to disable it immediately after use as it will continue to alter anything selected which can be very frustrating.

23. Basic model complete
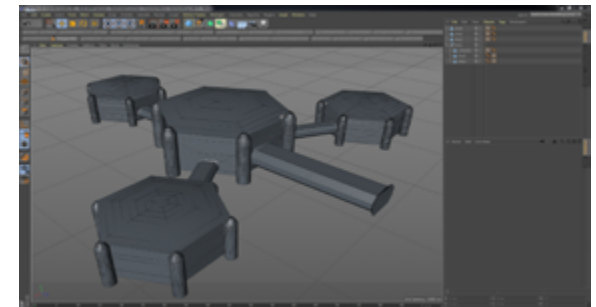
Fantastic! Our off-world habitat is well and truly on its way. You should already be starting to get the hang of navigating in 3d space and finding your way around the C4D interface, which is really the most important step. In the next part of this series

we will continue the techniques we have used here and introduce more advanced concepts to create more unique assets.

In the meantime, keep practicing the techniques we have covered so far by having a go at modelling the spaceport.

There are no rules to what it must look like just be sure to include a kind of train platform for our terrestrial transport vehicle to dock at. At right is what I came up with using only the techniques covered so far.

For cohesion I continued with the Hexagonal shape, increasing the ergodic value of our world.

OK have fun. 'Til next time.
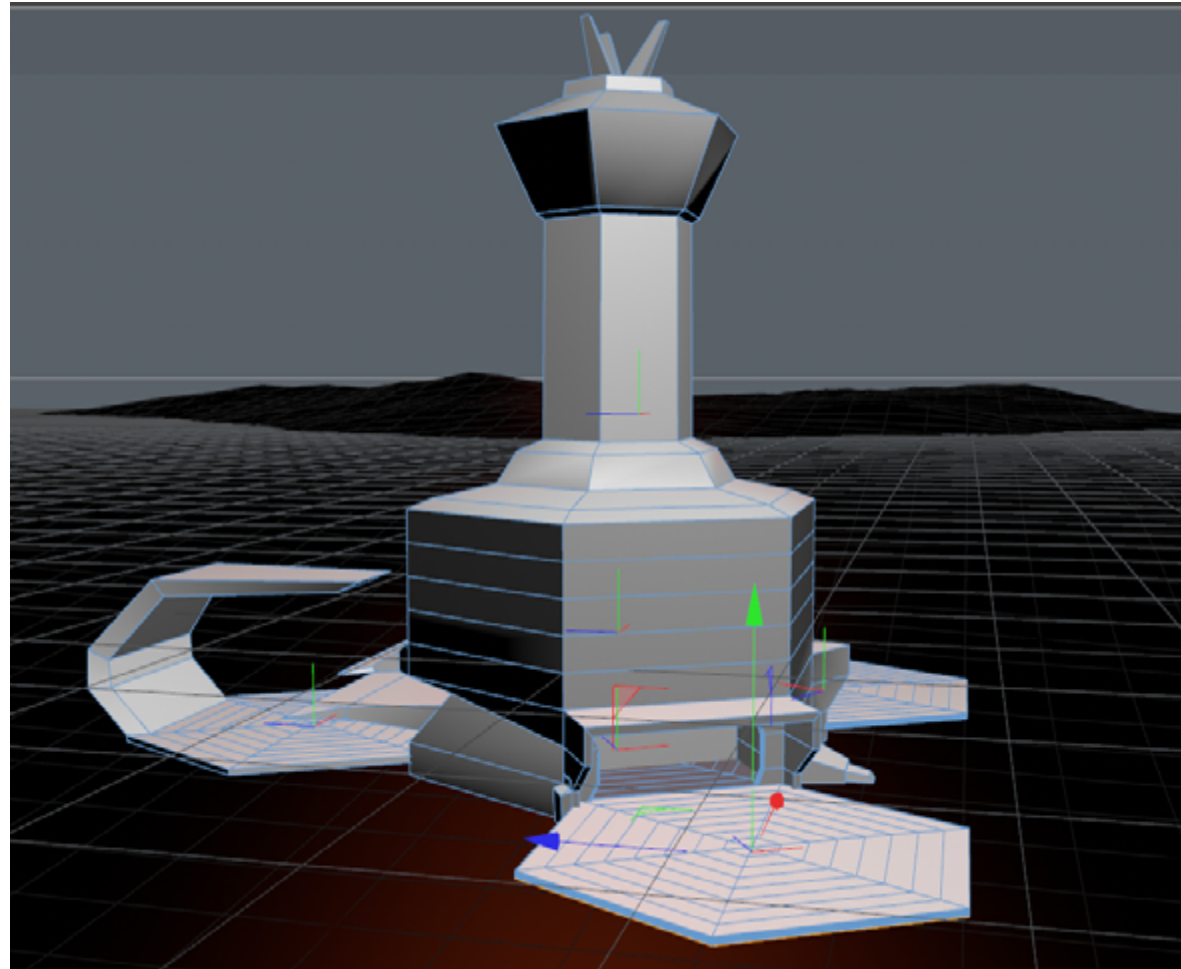
*If you don't have a copy of Cinema 4D, download a fully working trial version for Mac or PC at **www.maxon.net.***

Review: DJI MAVIC MINI (Pt 1)

Baby drone packs a wallop in a teeny, tiny light weight package.

The DJI Mavic Mini is the company's latest kid off the block – although in this case the term "kidlet" is more apt. It is tiny, but still technically packs a punch.

I am doing this review in a couple of parts (at least), as it warrants a little more than a simple review I feel. This is because the DJI Mavic Mini could be the most important drone – commercially for them – that DJI have made to date. And there is a lot to explore.

Over the years I have tested many drones from various manufacturers such as Parrot, GoPro, Dobby, and Swann but none of these has come even close to what DJI has offered in the past.

The last DJI drone I tested was the original Mavic which I took up to Broome and zipped it around the tidal beaches for some fun, and even made a couple of videos at *Eco Beach Resort showing the differences up in the Kimberley of Western Australia region between high and low tide.*

But that cost a coupla grand, putting it out of the reach of many, thus leaving a price hole for the knock-off manufacturers to plunder with inferior product. The Mavic Mini is only $599 though and from only a single 2 minute flight shows its quality and capability in comparison. The knock-offs cannot even hope to compete.

My benchmark comparison for drone

testing, which many may scoff at as I admit, this was not a commercial success, is my **GoPro Karma**. Why is it the benchmark? Quite simple; I can take it out of its case, press the starter's button and assuming all is fully charged, it just works. There is

ed controller to do its thing. And I do find some aspects of this a little fiddly.

You see, a cable is used to connect from the controller to the charging / comms port on your phone and hence to the DJI Fly software

this cable and get into the slot of the controller.

Once that is done, you do need to pair the controller to the Mavic Mini, or more correctly, I had to. I would have thought this was automatically

no need to use a smartphone as a pseudo controller as it has a dedicated one with its own LCD screen, and I like this.

In comparison, the Mavic range, including the Mavic Mini uses a combo of your smartphone and a dedicat-

installed. I just find this cable, which can be USB-C, mini-USB or a Lightning cable with all three supplied, quite short, and with the **Huawei P9** phone I was using (my own Samsung Galaxy 7 is not that flash in bright sunlight) was a bit o' a bastard to setup with

done at the factory, but there you go. Prior to this though, both units need to be turned on and unless you have Mavic experience or read the manual (which wasn't in the box and had to be downloaded), this basic step alone will drive you nuts!

It is not as simple as just pushing the go button on each of the controller and drone as would be (seemingly) obvious. Oh no. You have to press once, let go and then do a press and hold on each to actually get the engines firing.

Aha! Success you think, until you see a warning message on screen letting you know the firmware is out of date and therefore has to be updated before you can fly.

This takes another 15 minutes or so and even then, you cannot just walk outside and go for a leisurely spin above the treetops.

First, I had to set the compass by doing a drone vertical and horizontal orientation.

Then and only then can you navigate the software and actually get the thing in the air.

Now, for the seasoned drone users out there, I know this stuff is mostly the norm for the more advanced drones that need GPS and the like to be able do the party tricks their masters have instilled in those clever little silicon chippy things on board.

But I think a better pre-first-ever-flight cheat sheet would be a good idea so as to prepare the newbie user for the sequence(s) needed.

It's a bit like getting a new toy for Christmas only to find it needs batteries and all the shops are shut.

"Yes you can play with it Johnny, just not straight away…"

My review unit also came with optional prop protectors, and whilst a 5 year old who is au fait with Hungry Hippo or Mousetrap will tweak straight away how to fit them, many will need to hunt down the YouTube video I suspect.

They are akin to those puzzles of yore, where two seemingly simple blocks are put together to make a pyramid, but you go insane working out what are the correct angles to place them

both at.

Despite these criticisms, they are in the overall scheme of things quite minor, and I only mention them here to pre-warn potential buyers of what to expect.

In the bigger world, the Mavic Mini is a fabulous piece of kit with capability way beyond what you'd expect from the price tag.

I know you'd sort of expect that by now, with it coming from the brains of a company with a pedigree in this area that is now just about without peer. But it is still really nice to be surprised.

More on the actual capabilities and flying experiences in the next instalment (only caused by the fact at the moment here after 10 days+ of glorious above 30 degree windless days, we have lots of bushfire smoke and a stiff breeze which is not conducive to mini drone flying obviously).

And I can't wait!

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Audio for Action Cams ...

by David Hague

I love using so-called "action cameras". You know, GoPros and models from DJI, Sony and countless "knock-off" brands.

That's cause I have habits of throwing cars around race tracks and dirt roads, attempting to catch a piscatorial feast in the briny or simply paddle around coral reefs with a snorkel, mask and fins (they are NOT flippers!).

But there is somewhat of an issue with action cameras in these sorts of circumstances in that audio in many cases seems to be a secondary thought.

Sure, I understand that what they are really designed for is to be a camcorder with a small form factor and a wide lens to capture, well, action, in places and angles that a "normal" camera or camcorder cannot possibly hope to achieve.

But along with that hair-raising, stomach churning, bum-cheek clenching, gritted teeth vision, is almost always loud gasps, cheers, screams, yells and even downright terrified sobbing at times. Shouldn't this also be captured for the posterity of the event, no matter how embarrassing it might be after the fact?

'Cause we do!

Now, with GoPro having the majority of this market, and a snoop around various action cam type forums leading us to the opinion the general consensus is that GoPro audio sucks (not necessarily our opinion I hasten to add), we have used this as a basis to see just what can be done about that situation, without necessarily adding a huge bulky mic to the

camera, or worse, making it that it just cannot do what it is best at and being attached to things other than a tripod eg you head, arm, chest, bike, car, go-kart, surfboard, skis, fishing rod, boat etc.

You can of course add a standard type mic to a GoPro using the available mic adaptor which plugs into the charging port, converting it into a 3.5" headphone type port, and then use something such as a *Sennheiser MKE400* or *MKE 440* shotgun mic (which actually appear on the GoPro recommended list along with some other manufacturers including RØDE, Sony and Shure.

For best results, we recommend using the standard GoPro skeleton mount so you can still attach the camera to one of the many accessories available from both GoPro and 3rd party suppliers, as this leaves the ports available to use via cutouts in the mount design.

If you prefer to have a more discreet system, then a wireless lav setup might be better, keeping the mic clipped to a collar or similar, and the receiver via a cable connector to the camera.

However, a major problem exists in one area. If you want to shoot in a wet area – rain, snorkelling etc – then waterproofing is of course paramount and using any of these mics is not going to work. This means you are stuck with using the correct housing for the camera for this environment and its native inbuilt mic sadly.

But!

If you can get your hands on a Go-Pro Hero 4 Silver via ebay, Gumtree or wherever, then Sennheiser do make a dedicated mic for this camera that is waterproof called an *MKE 2 Elements* that costs around AUD$80. The *MKE 2 Elements* has an interface board that allows it to become a part of the main camera body and is very effective.

Just make sure if you order one, you specify the word "Elements" very clearly as the MKE 2 without the "Elements" is a very different beast entirely!

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