

Panasonic
CINEMA



EVA1 QUESTIONS ANSWERED

Previewed at Cine Gear Expo 2017 in Los Angeles and launched in November 2017, the AU-EVA1 has come a long way in a short period of time. Equipped with a 5.7K Super 35 sensor and positioned between the Panasonic Lumix GH5 4K mirrorless camera and the VariCam LT 4K cinema camera, the EVA1 has already shot several high-profile productions within numerous industries. Compact and lightweight, the AU-EVA1 is tailor-made for handheld shooting, but also well suited for documentaries, commercials, and event shooting. With several free firmware upgrades in the past year, the EVA1 meets the standards the production industry requires.

We asked Panasonic Cinema Product Manager, Mitch Gross, some general questions on shooting applications, Dual Native ISO, the 5.7K sensor, lens mount options, RAW capture, and more.

EVA1

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For whom is the EVA1 designed?

MITCH GROSS: Depending on the type of work you do, EVA1 answers a lot of different needs. It is designed to be a versatile machine that you can plug into a lot of different situations. There are people who have been shooting on smaller cameras such as DSLRs or all-in-one camcorders, and they have felt limitations. At the same time, you have other people who have been shooting on large production cameras and they sometimes have need for a camera that is slimmed down and more portable. What we wanted to do was build a camera that could sit in-between those spaces where you could essentially rise up from the small cameras where you want more versatility and you don't have to fight the machine sometimes. Or you could slim down from a bigger camera for projects where a larger system may be too difficult to deal with or simply too expensive for the production. On the little cameras, you can get amazing work out of these tiny machines but because they're so small, dealing with the controls can become a barrier and you often must devise workarounds. Shooters put up with the workarounds because these small cameras are so convenient to shoot with. We've risen the scale of the camera so now you have these high-end features and easier access to controls in a camera that is a more functional size for most shooters. For users of higher-level production machines, we've tried to be judicious in keeping as much professional functionality as possible into a compact form factor. If you design it correctly, it's easy to make any camera expandable with accessorizing. Getting it small but still functional is the challenge.

What are the main shooting applications for EVA1?

MITCH GROSS: We see a lot of people shooting documentary style work with the EVA1 – talking head interviews and B-roll shots in the field. It's very convenient for that style of shooting. You're also going to have people who do news shooting, as well as live event type work such as weddings and sports videography. And a lot of high-end production for narrative work needs the versatility of a camera like the EVA1. That means TV series shot with multiple cameras and productions shot on larger cameras like VariCams with the EVA1 as a B-Camera. For some mobile productions, the EVA1 becomes the A-camera with small mirrorless cameras like the GH5S grabbing additional footage. In addition, there will be people who will want to rig the camera for specific types of remote work, meaning mounting the camera out on a crane, or jib arm. You want it fully featured yet small and lightweight because the bigger your camera is, the bigger crane you would have to use, just like on a Steadicam. Gimbal devices like a [Freefly Systems] Movi or a [DJI] Ronin want a fully featured camera but in a small and lightweight package. With EVA1, you get the dual advantage of having great capabilities while being lightweight and small. Same goes for underwater housings, car rigs, or anytime you need to place a camera somewhere where you want a slimmed down unit that won't get in the way. You still want to have a capable camera, especially with a Super 35 sensor, and the EVA1 provides just that.



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What are some of the specific features EVA1 gives you that a compact DSLR or mirrorless camera won't?

MITCH GROSS: The first thing is that people who are shooting with a [Panasonic Lumix] GH5, is that they are shooting with a Micro Four Thirds sensor and EVA1 contains a Super 35 sensor, which gives you a different look and feel. The larger body size of the camera, the design of the interface, and where the LCD is located all give you better access to the controls to make adjustments while rolling. With small DSLR cameras, you can't comfortably change things as you're rolling in a run-and-gun style and that's a problem – you need to be able to adjust on the fly. In addition, we have proper connectors – real XLR audio inputs, full-size HDMI and locking SDI connectors for video outputs. We have a full-fledged camera that's designed for video production. It has a removable side hand grip with integrated controls. The EVA1 is designed to be held up to your shoulder as opposed to way out in

front of you, or at your waist. Another example of control you have while shooting video are the integrated ND filters. You have a filter wheel that is built into the camera, so you can adjust exposure as you roll – you don't have to stop and screw on a filter in front of the lens. The overall design of the EVA1 is to make it more comfortable for video production, as opposed to a stills camera that is doing double duty as a video camera. And if you want the option to output RAW, the EVA1 is the only camera to offer 5.7K, 4K and 2K with a frame rate up to 240fps.

For a cinematographer that has never shot with Dual Native ISO, can you explain this feature?

MITCH GROSS: Panasonic developed a process to read the sensor's photosites in a fundamentally different way than it's traditionally done. More information can be extracted without degrading the image. That effectively gives the imager greater sensitivity and separates the signal from the background noise. It's essentially a different way of reading the camera sensor and it gives it two different native ISOs or sensitivities. In other cameras, you just dial the gain up to get more sensitivity, but you get a lot of noise in the image. You can also do that on the EVA1, but if you just switch between the two native ISOs, they'll look the same as far as the amount of noise. There are two ways that one might likely want to use this. First, you can shoot with zoom lenses when normally you would have to shoot with primes because zoom lenses generally aren't as fast. Instead of having to switch prime lenses, you have more versatility while still getting the right exposure. Another way of using Dual Native ISO is the ability to lower your light levels. In shooting with lower light levels, you will save money, time, and you can shoot with more practical lights in your surroundings. Cinematographer William Wages, ASC says that Dual Native ISO let him reduce his lighting package from an 18-wheeler to a small box truck, and he saved a couple hours in the beginning and end of each day not unloading a huge truck and running long lines of power cabling. That can be for a high-end production or a more modest production where it can be used for savings, or a stylistic choice. The Dual Native ISO ratings on the EVA1 are 800 ISO and 2500 ISO, and the sensor captures a Dynamic Range of 14 stops, so you can really see far into shadows and highlights.

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The EVA1's sensor is a 5.7K sensor.
What does 5.7K resolution do for you?

MITCH GROSS: There are three things. The EVA1 sensor has 17.25 million active photosites in Super-35. That's almost twice the resolution of a 4K image. When you start with one resolution and you go to a lower resolution, it always improves the resolving power of the final image. When you start with more and get to less, more information comes through. The result is a more finely detailed image. That can be true when you go from a 5.7K sensor to 4K, UHD, 2K, HD, or 720p – all of which are available on EVA1. Second, there's more color information. At 5.7K resolution, you have more individual examples of red, green, and blue – all of which enrich the resulting image in whatever resolution you choose to record. Third, the EVA1 has can be switched to RAW data output from the camera to a separate recorder. Currently the Atomos Shogun Inferno can record EVA1 5.7K up to 30p in ProRes RAW. It can also record 4K up to 60p and 2K up to 240p, all in ProRes RAW, and capture 4K30p and 2K120p in CinemaDNG RAW. More is more, and it gives you greater choices in what you might do with it in the future.

What kind of media does
the EVA1 use?

MITCH GROSS: Part of the design ethos of the camera was to not only make the camera itself affordable but it had to be affordable to use. The EVA1 uses SD cards to record footage and it can record in various codecs, including 4K 10-bit 422 to fast SDXC cards. The cards are readily available everywhere in the world so if you're a documentary shooter in a remote location, you can purchase more cards and stick them in the sides of most laptop computers or pick up an adaptor at any electronics store. The usability of the camera is high, and the expense is kept at a minimum. Depending on the selected format we require cards that can do certain read and write speeds. For the highest resolution and frame rates with the mildest compression, V60 type SDXC cards are required, but for other formats one can use cards of lesser capabilities. The EVA1 has two SD card slots and you can choose to either Span recording – capturing continuously from one card to another for extended record times – or Clone recording – recording simultaneously to both cards for an instant backup. There's also a single frame record mode for shooting time lapse and a prerecord function for wildlife and sports.

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What are the frame rate capabilities of the EVA1?

MITCH GROSS: The EVA1 can shoot internally to the SD cards in 4K up to 60fps and in 2K up to 240fps. That's a lot of information to process so fast, so at some frame rate and resolution combinations the EVA1 does some clever tricks. When shooting 2K and HD, the EVA1 can sample the full sensor's resolution in half, averaging the information while still seeing 2.8K. Then it oversamples that 2.8K down to 2K or HD, yielding a high-resolution image while saving processing power. By doing this, EVA1 can shoot at 2K or HD and retain the full Super-35mm field of view of the sensor up to 120 fps and record in a 10-bit 422 codec. To get up to 240 fps, the frame is slightly cropped to 4.5K, sampled in half to 2.2K and then that 2.2K is oversampled to 2K or HD. It might sound complicated, but it's quite clever math that allows EVA1 to shoot 2K and HD at high frame rates and still capture a high-quality image. And instead of cropping in the image to a tiny rectangle in the center of the sensor, the crop to get to the highest framerates is still about 80% that of the full Super-35 sensor.

What are the RAW capabilities of the EVA1?

MITCH GROSS: When the EVA1 is switched from video mode to RAW mode, it becomes a bit of a different camera. The EVA1 uses its 6G SDI output to send RAW data to a separate recorder. The RAW outputs are 5.7K up to 30fps, 4K up to 60fps, and 2K up to 240fps. 5.7K uses the full Super-35 sensor area, 4K is a 4/3" pixel-to-pixel crop, and 2K uses the 4/3" 4K area. Currently the Atomos Shogun Inferno and Sumo 19 recorders can capture the EVA1 RAW signal, recording all resolutions and frame rates in ProRes RAW or 4K up to 30p and 2K up to 120p in CinemaDNG RAW. These recorders can also take the RAW signals, process them into video and record traditional ProRes or DNx video files.



Why are there so many recording formats in the EVA1?

MITCH GROSS: EVA1 is designed to be used in a variety of situations for a variety of clients. Its highest-level recording format, 4K 10-bit 422 All-I, is approved for all productions by Netflix. It can shoot 2K 10-bit 422 up to 120p using the full Super-35 sensor, or if you really need some speed, it can get up to 240fps in an 8-bit 420 mode. For several modes the EVA1 offers recording options in both All-I and LongGOP codecs. They're of comparable quality, it's really a question of workflow options. All-I takes up more room on the memory card but is easier to process in a computer. LongGOP uses about a third the storage space but it requires the post program to read multiple frames at once. If you're shooting a long form documentary, you might really care about storage space and can deal with a beefier computer once you get to post. If you're shooting a commercial, you might want large files, but still be able to view them on your laptop on set. EVA1 gives you a choice. We even added an option after release. Several news shooters were interested in the camera, but their workflow dictated 1080i recording in a small high-quality file size, so Panasonic added HD 1080i in All-I 100Mbps and LongGOP 50Mbps.

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What are the monitoring options on the EVA1?

MITCH GROSS: Sometimes the only person looking at the shot is the person behind the camera. Sometimes there may be multiple people but they don't all want to see the same thing. If it's just one person, he or she can view the shot on the adjustable LCD screen or set the SDI output to clone the display of the LCD to another monitor or viewfinder. All of the heads-up data such as frame rate and lens settings can be individually switched on/off and assist functions such as focus, framing and exposure aids can be customized and switched on/off at will. If shooting in V-Log, the image can be displayed with or without a Rec709 monitoring correction, but the exposure tools will always display the Log levels to allow for quick comparisons. If others need to see the image as well the EVA1 offers great flexibility. There are two video outputs, an HDMI and an SDI, and both are capable of 4K and always active even when recording. There are several combinations of signal possible: one output can be in 4K while the other is HD, and one could be a clean image with no display information while the other has just the info you choose to show, which can be different than what is displayed or not on the camera's LCD. If shooting in V-Log, the monitoring Rec709 correction can be selected individually for any or all of the three outputs. An example of how this flexibility can be used would be an EVA1 recording in V-Log for post color grading; the camera LCD displaying the 709 monitoring correction with a waveform monitor exposure tool in the corner of the frame showing the V-Log levels for comparison and the on screen display data showing lens and color temperature info; the SDI output in 4K 10-bit 422 in V-Log with no data displayed going to a video recorder; and the HDMI output sending HD video with the monitoring correction applied and the clip name and timecode displayed feeding a video transmitter for a script supervisor and director to view. That's just one scenario but there are lots of possibilities and for other cameras this level of flexibility would require a small cart of boxes and converters.

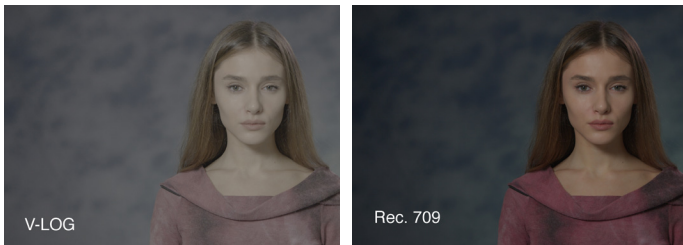
What is ProRes RAW?

MITCH GROSS: ProRes RAW is a new recording format and Panasonic is proud to be the premiere camera manufacturer associated with it. ProRes RAW is a compressed form of RAW and is currently available in two compression levels, ProRes RAW HQ is 3:1 and ProRes RAW is 4:1. It was developed by Apple in coordination with Atomos. Atomos recorders can accept RAW data signals from several cameras and record using ProRes RAW. These files can then be seamlessly edited in Final Cut Pro X. The two highest level cameras supported by Atomos recording in ProRes RAW are the Panasonic VariCam LT and the EVA1. All the EVA1 RAW formats are supported, 5.7K up to 30p, 4K up to 60p, and 2K up to 240p.

What are the audio capabilities of the EVA1?

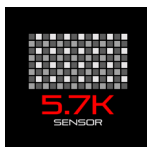
MITCH GROSS: The EVA1 is a professional production machine, and that means that it has proper professional features and controls in every aspect. The camera can record two tracks of audio and it features a pair of XLR audio inputs. There's also a built-in stereo ambient microphone and an isolation mount for a shotgun mic. Beyond just having the items on a checklist, great care has been taken to integrate them into the camera's design for the best functionality. The XLR jacks are in the back of the camera behind the handgrip mount and are angled slightly so that connected cables will point away from the camera. The camera's handles can be removed without loss of the audio functions and there are no cables pulling in odd directions or protruding where they can be easily snagged. There are a few physical knobs and switches for audio level control right on the operator's side of the camera, with an audio level display available on the LCD screen while viewing the image and several pages of fine detail control available in the menu of the EVA1. This allows proper live adjustment of levels while shooting without cluttering the camera's control surface. There's even a clear plastic door covering the audio controls so that the operator can check the settings without fear of accidentally altering levels while handholding the EVA1.

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What are V-Log and Scene Files?

MITCH GROSS: The EVA1 sensor and image processor can see 14 stops of dynamic exposure range. That's a very far reach into bright and dark at once. There are different ways all this information can be used. There are five Scene Files preset in the EVA1, two that are cinema looks with one allowing greater information in the highlights and the other providing more in the shadows. The next two are broadcast video looks, again with one giving extra room for highlights and the other extra room for shadows. And the last Scene File is designed for HLG, a live HDR output to spread all that exposure range for HDR monitoring. Anyone can create their own Scene Files to load into the camera to utilize the image information as they wish. And the EVA1 can also record in V-Log, which flattens out all the exposure info to store as a video file for later color grading in post. While the Scene Files are designed to be used as finished images, V-Log is specifically for post image grading. It captures the full range of exposure and color for later manipulation. A V-Log image appears pretty washed out on its own, so the EVA1 includes a standard Rec709 monitoring mode so that a normal color correction can be viewed while shooting. The three monitoring outputs, the LCD, the SDI out and the HDMI out, can individually set to view in either V-Log or the "corrected" view, and User Buttons can be programmed to quickly toggle any of the outputs between the two views.



Why does the EVA1 have an EF lens mount?

MITCH GROSS: There are two de facto standard lens mounts for Super-35 cinema/video production, PL and EF. There are literally hundreds of available models of EF lenses, and the sheer volume of lenses available is mind boggling – it's somewhere between 100 and 200 million lenses! This means they're readily available with lots of options, and many people already own some. Most EF lenses have electronic features of which the EVA1 can take advantage, such as iris control, optical image stabilization, one-push auto focus, and on some lenses even a motorized zoom and a record trigger. Panasonic has tested many models of EF lenses and published a compatibility chart for their use on the EVA1 (<https://pro-av.panasonic.net/en/eva1/lens/>). In addition to these electronic EF lenses, there are many manual lenses available and these are all compatible with the EVA1. Most EF lenses are quite affordable, small and lightweight, which compliments similar aspects of the EVA1. And many modern cinema lenses are available with interchangeable mounts. For those who need a PL mount, there's a retrofit kit available for the EVA1 from a 3rd party manufacturer.



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