S8/8 FF | 32mm

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It's written, edited, and published by Jon Fauer, ASC, an award-winning Cinematographer and Director. He is the author of 14 bestselling books—over 120,000 in print—famous for their user-friendly way of explaining things. With inside-the-industry "secrets-of the-pros" information, *Film and Digital Times* is delivered to you by subscription or invitation, online or on paper. We don't take ads and are supported by readers and sponsors.

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Contents: Apr 2022 Issue 114

Cover Story:
Introducing Cooke S8/i Prime Lens Series

Cooke S8/i T1.4 Full Frame Primes

New Cooke S8/i Full Frame Primes arrive in response to requests from cinematographers, camera operators, focus pullers and rental houses for smaller, lighter and faster Full Frame lenses.

Cooke S8/i Primes have a maximum aperture of T1.4. In comparison, Cooke S7/i Full Frame Primes open to T2.0. Not only are S8/i faster, they are also lighter and smaller than most contemporary Cooke lenses. S8/i have a 104 mm front diameter. S7/i have a 110 mm front diameter, as do the 35mm format S4/i and S5/i. It gets even more interesting when you hear that the S8/i series were designed and built using only spherical elements. They do not contain aspheres.

"Work wide open" is a favorite lens mantra. "Don't stop down!" And so, S8/i Primes open up the widely opened T1.4 aperture world for Full Frame / Large Format. Bokeh blossom beautifully: smooth and natural. They are round in the center of frame and take on a cat's eye oval shape when off-axis. All focal lengths exhibit similar symmetrical bokeh shapes at all focus distances.

Spherical elements see to it that you will not see any onion ring artifacts. The only one crying could be a Focus Puller lacking the big sensor lifeline that is the Preston Light Ranger 2, thus assuring sharpness even with a T1.4 four-eyelash depth of field at 100mm, as shown below. Of course, the ever-popular Cooke Look is in full Full Frame parade: a delicious depth of field roll-off and smooth focus fall-off at the periphery, all the better to guide your eye to the object at the center of your attention.

At launch, there are seven S8/i Primes: 25, 32, 40, 50, 75, 100 and 135mm. They all open to T1.4 and all have a 104 mm front diameter. Prices at launch are US $34,650 for 25mm to 100mm S8/i and US $36,100 for the 135mm S8/i. Additional focal lengths are planned: 18, 21, 27, 35, 65, 85 Macro, 180, 250 and 350 mm.

Below: ECU, 4 eyelashes sharp, Cooke S8/i 100mm at T1.4. Bill Bennett, ASC, was the cinematographer and one of the first to try these lenses on *High Desert*. He said, "How they did it—I would love to know— because usually when lenses become faster, they

get bigger. "When they decided not to use aspheres, that could have a lot to do with how the lenses look. When the S8/i Primes are wide open at T1.4, they are especially beautiful."

Raphaël van Oostrum, who was Steadicam Operator on that first production, said, "The new S8/i is, to say at least, a friendlier Cooke lens for Steadicam since its weight and mass, that sit in front of the camera, are considerably less."

Sara van Oostrum was the Director of the short film *The Fishy Chess Move,* frames above and below. Daan Kramer was the Cinematographer and he worked with Cooke S8/i Primes wide open. The look includes smooth skin tones and lustrous bokeh.

See how these Cookes look, here and on the following pages.

Above: Cooke S8/i 100mm at T1.4.
Below: Cooke S8/i 75mm at T1.4.

Cooke S8/i Specifications

Lens	25mm	32mm	40mm	50mm	75mm	100mm	135mm
Aperture	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22
Close Focus from Lens Front	335 mm	460 mm	450 mm	500 mm	585 mm	670 mm	960 mm
	13"	18"	18"	20"	23"	2' 2"	3' 1"
Min. Marked Object Distance	550 mm	650 mm	650 mm	700 mm	800 mm	850 mm	1200 mm
	22"	2' 3"	2' 3"	2' 3"	2' 9"	2' 9"	4'
Length from Front of lens to Lens Mount	162 mm	156.9 mm	159.6 mm	157 mm	156.9 mm	156.9 mm	200 mm
Length from front element apex to Lens Mount	158 mm	143 mm	146 mm	143 mm	143 mm	128 mm	190 mm
Max Front Diameter	104 mm	104 mm	104 mm	104 mm	104 mm	104 mm	104 mm
Angular Rotation from MOD to End Stop	270°	270°	270°	270°	270°	270°	270°
Angular Rotation of Iris Scale	90°	90°	90°	90°	90°	90°	90°
Max. Diag. Angle of View for FF Format	81°	67°	56°	47°	32°	24°	18°
Total Weight	2.47 Kg	2.43 Kg	2.37 Kg	2.16 Kg	2.48 Kg	2.45 Kg	3.24 Kg
Price announced at launch in US $	$34,650	$34,650	$34,650	$34,650	$34,650	$34,650	$36,100

Maximum Image Area Coverage	S8/i primes cover image circle diagonal ⌀ 46.31 mm
Focus Scales	Two Opposing Focus Scales – Dual scales Metric and Imperial. Scales marked from MOD to infinity. In other words, each focus ring is engraved with both Imperial and Metric—you just flip it around.
Focus Drive Gear	140 teeth 0.8 M
Iris Scales	Two Opposing Linear T-Scales – marked in whole and 1/3 stops.
Iris Drive Gear	134 teeth 0.8 M
Screw-In Front Filter	M105 x 0.75
Optical Design	The S8/i series contain only spherical optical elements. There are no aspheres.
Matching	All S8/i primes are color matched.
Lens Mounts	Titanium PL or LPL mounts with /i Technology contacts
/i Technology	4-pin external Lemo connector and contacts in the lens mount. Lens metadata includes focus and Iris position, focal length, serial number, and individually calibrated lens distortion and shading maps.

Additional Cooke S8/i Focal Lengths in Development

Additional focal lengths are in development:

Lens	18mm	21mm	27mm	35mm	65mm	85mm Macro	180mm	250mm	350mm
Aperture	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22	T1.4-T22	T1.8-T22	T2.5-22	T2.8-22

Data published in these charts is subject to change.

Cooke S8/i T1.4 on *Fishy Chess Move*

Above: Cooke S8/i 100mm at T1.4.
Below: Cooke S8/i 50mm at T1.4

Above: Cooke S8/i 40mm at T1.4.
Below: Cooke S8/i 50mm at T1.4.

Cooke S8/i Full Frame Primes BTS in Brussels

Above: Director Sara van Oostrum with 50mm Cooke S8/i on Optica Magnus FF finder.

Cinematographer Daan Kramer with finder; Director Sara van Oostrum; Art Director Cato van Passel; and Focus Puller Nathan Lederman.

Cinematographer Daan Kramer discussed the backstory:

Camera

We used an ARRI ALEXA Mini LF and shot ARRIRAW Open Gate on *Fishy Chess Move*. The camera and gear came from cinematographer Danny Elsen and Lucky Cameras here in Belgium.

The camera build, handsomely put together by camera assistant/ focus puller Nathan Lederman, was unbelievably well balanced and overall was a lovely setup to use. The new Cooke S8/i are light and small, making them great for a more compact camera without having to make sacrifices in the speed of the lens. I can imagine that these small yet mighty lenses would be excellent to use on Steadicam or on Gimbals.

Look

In term of the look, the lenses are familiar to what we've come to expect from Cooke Optics—yet they went above and beyond because they are fast lenses. The focus fall-off is beautiful and has this creamy feel without seeming unnatural. This made it possible for us to really isolate the little boy in our story, to really dive into his imagination. The Full Frame format's look also added an epic feel to the images.

Focus

About focusing wide open at T1.4, Nathan Lederman, the sharp focus puller on the shoot, said, "I mapped all the lenses on my cmotion cPRO PLUS in combination with my Cine RT Ultrasonic rangefinder."

Story and Style

Sara wrote the script herself. For the past couple of years, she has mostly focused on content with a magical feel and where a child's fantasy comes to life. So, when she heard that she got the assignment to do a showcase film for the new Cooke S8/i, she tried to take this opportunity to further explore. These lenses were ideal for this theme. Sara really wanted to establish a magical realism tone.

The location for *Fishy Chess Move* was in Brussels. It was an early 20th century café built in the Art Nouveau style typical for that period. The location was specifically chosen to fit the warm look and feel that Cooke optics are known for. We also drew a lot of inspiration from Impressionism and the film *Hugo* on which I believe Bob Richardson, ASC also used Cooke lenses—Cooke S5/i.

Cooke S8/i 100mm

Cooke S8/i 50mm

Cooke S8/i on *High Desert*
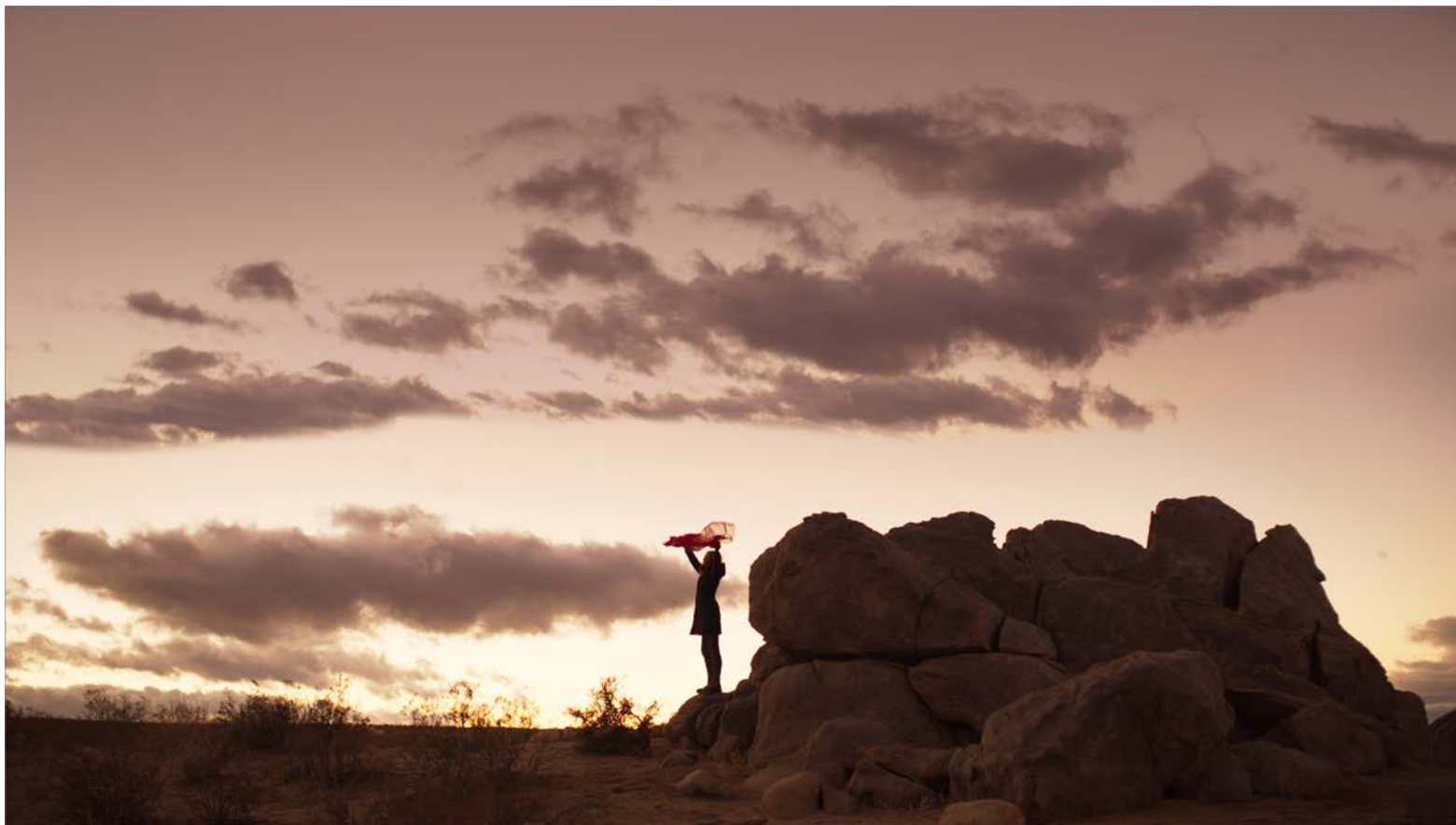
Cooke S8/i 32mm

Bill Bennett, ASC, in the blue jacket to the left of the ARRI ALEXA LF, was the cinematographer. Bill said, "It was really cold, with strong winds blowing across the high desert plain, 20 miles northeast of Palmdale California, in the middle of nowhere." Kees van Oostrum, ASC, directed.

He's in brown trousers, under the black furniture blanket, looking at the monitor. Actress Anna Khanzhina-Albright is at the top of the hill. Gaffer: Rodney Charters, ASC. First Camera Assistant: Ambar Capoor. Steadicam Operator: Raphaël van Oostrum, above right.

Kees van Oostrum, ASC, NSC, SBC, AIC

Above: Kees van Oostrum, ASC, NSC, SBC, AIC, and Chairman of Cooke Optics.

Jon Fauer: Please tell us about your work at Cooke.

Kees van Oostrum: My association with Cooke is interesting. Let me put it this way: first, I'm a cinematographer, always have been and will be. Second is my love for optics, which has been ongoing. Optics have always been of great interest to me. And third, I'm very flattered to have been asked at the time by Les Zellan to become his successor as chairman of Cooke Optics. I accepted that challenge and have enjoyed it very much, because what is better than to come into the Garden of Eden of cine lenses and deal with design and products that might make a difference in the world of cinematographers. I think that I would describe my situation right now as one that is very fortunate and interesting.

What does the job of chairman involve?

It is many different things. I'm approaching it with a certain amount of expertise in the area of lens look. I obviously don't design lenses. At Cooke, that's done by a team of optical and mechanical designers, supported by Iain Neil, the Chief Optics Advisor. But there's a lot to talk about lenses, about what they look like, how they feel. There's also an importance in what are you actually going to build next. What do cinematographers want to see? How is the industry changing? How is the technology of recording those images changing? In a way, most companies are run by technology-oriented people who may not necessarily be sensitive to the likes and dislikes of cinematographers. At best, they listen to cinematographers, but listening and knowing are two different things.

Can you say that yours is partially a role as a product manager who listens to colleagues and then filters those comments to the lens designers? You are also one of the few cinematographers actually working at a lens company.

I don't think product manager is the right description. Andy Buckland is Director of Product Management at Cooke and does exactly that. He and the sales representatives stay in touch with the clientele, which would be cinematographers, and of course the rental houses. I think my dynamic is more like what I said earlier. I love optics. I have a certain opinion about it. I also have a love for the Classic Cooke Speed Panchros, which we cinematographers all talk about ad infinitum. So now I look at the lenses, at the focal lengths, and I say, "Well, we're missing something here, I think, because when you shoot, you need X, Y, Z." So, I would say I'm more the voice of a cinematographer.

You're an advocate, then.

An advocate, or rebel sometimes—because sometimes you have to step up and say, "No, that's not how it works."

How often do you meet with the rest of the team at Cooke?

I probably have about ten Zoom meetings a week with various people. Board meetings are once every month. I meet with the design group every Monday. I talk to Iain Neil about once every day. I've known Iain for 35 years or so, ever since I was starting as a cinematographer. I went to Panavision one day, and Iain had just arrived there. I spent many hours with him in the lens design room because we were always mucking about. Even then, Iain was very engaged with cinematographers in trying to create certain looks. We were at the beginning of the Primo era then. Probably for the first 15 years of my career, I was a Panavision guy. So, there's a long legacy of that. Basically, Iain and I visited frequently up until he left Panavision. And then I lost track of him for a while, because he moved to Switzerland, and started consulting at CW Sonderoptic (now Leitz) and then Cooke. So this was a wonderful, how can you say, re-meeting the Pope after all those years.

You probably picked up right where you left off.

He knows the character of every lens. He knows why you would like something, the potential reason, and things that are not necessarily a design issue. Besides talking about new products at Cooke and developing some of them, we now talk a lot about what is it that ticks in a certain lens. What is the heart of that lens? Why would people like it so much? Or why do I like it so much? What does he think? It's a fascinating conversation every time we broach the subject.

What trends do you see in lenses and looks? For a while, there was a trend of distressed vintage, and now it seems to be shifting again.

I think we want lenses that have a certain feeling and that mean something. It isn't necessarily extreme vintage. That's a choice. Extreme vintage works very well for a commercial, but doesn't always work very well when you do a theatrical feature, when you have multiple cameras going, when you need multiple sets of lenses, and you need a predictability about these lenses because they represent your look.

So, I think that Cooke, being one of the foremost lens builders in the world, must be able to appeal to both crowds. There is a large

Kees van Oostrum, ASC, NSC, SBC, AIC

Cooke S8/i Full Frame Primes render

market that wants a very bespoke look. And there is a huge, rapidly growing market that I would call the high-end professional market. This group wants the stability of a tremendous set of lenses that perform one after the other similarly, as far as the bokeh is concerned, as far as the way of treating highlights is concerned, flaring is concerned, and so on. But at the same time, we want something that is characterful.

That is a problem because lens design has become so technologically driven. It's become almost a computer game and a lot of lenses look so similar. The change of the DP behind the camera will do more than any change of the lens set being used. That doesn't mean all lenses are the same and, speaking as a cinematographer, we may fall in love with a certain lens. It may do well in the lens projection or prep room, but when you shoot a movie, you encounter multiple situations that you couldn't have foreseen. No lens projection tests in the world can ever cover what you encounter in the real world.

So, what happens at the end of a movie, and everybody loves what you did? It was okay and you got beautiful images. But maybe you didn't really like the ultimate look of the lenses. They didn't really respond; they didn't speak to you. That is where we are today, sometimes. We know there are differences in lenses that will influence your work, not only in the camera tests, but also in your journey throughout a whole movie, where you're dealing with situations of contrast and color that you couldn't have foreseen. And suddenly you put a certain lens on the camera, and wow. You

fall in love with that look. That's the cinematography approach, as opposed to a technical design approach.

That's an articulate explanation. You talked about the high-end. Do you see it expanding?

Oh, yes. And that's a good introduction to the next, new Cooke S8/i series of Full Frame lenses.

Cooke S8/i Full Frame Primes

I think the S8/i lenses are spectacular. They are fast—T1.4, Full-Frame, smaller, lighter weight, with titanium parts. What is really fascinating is that Iain Neil conceived these lenses without using any aspheric elements—all the way through the entire focal range. That gives the lenses a character that is unique. Opening wide to T1.4 on a non-aspheric lens, you still maintain wonderful focus. It does not just get softer. It creates a different look.

We have the combination of the new glass technology and a designer like Iain who knows how to bend the light in wonderful combinations. It adds an artisan craftsmanship that is very important in making lenses today.

Did you say there are no aspherics, only spherical elements inside?

Yes. The new S8/i Full Frame series are an interesting departure from the S7/i . We went on a quest to have the lenses lighter and smaller. It still features the Cooke look. But you have titanium mounts in the back and various weight-saving design elements.

Kees van Oostrum, ASC, NSC, SBC, AIC

Cooke Panchro/i Classic Primes - render

The Cooke design team has done everything to save weight. The S8 lenses just feel a lot easier to handle. You can hold them in one hand. And yes, the lenses are designed without any aspherical elements. This is a novel way constructing modern day optics and is a direct result of working with cinematographers to create a specific look.

Iain Neil can tell you exactly why. In some ways, these are a less complex lens, and they render differently. That's my feeling.

Evolution of Lens Design and Manufacturing

How is lens design and manufacturing evolving at Cooke?

Lens design has been evolving because we now know more than ever. There are, in the world, a few people, not many, who really understand the craft of building a lens and are able to take the new technology and source new materials and create something that is, in its own way, unique. And then, those lenses must address the likes or dislikes of a cinematographer, a singular artist.

You touched on something else that was interesting about lenses: repeatability.

Vintage lenses were designed in the film era. When you shoot on film, which we both did extensively, you need contrast and resolution. If you don't have contrast, after your negative has gone through all the steps we have now forgotten about—internegative, interpositive, and finally release print—and you see it in the theater, sometimes you are horrified because you lost everything you had gained.

It was important for those lenses to maintain resolution, and the importance of resolution has not changed. For example, I have an uncoated f/2.5 Cooke Speed Graphic lens from 1920s that I have used for some commercials at times. If you flag off all the

stray light coming in, and you do not have bright, shiny objects in frame, that lens might look as sharp as a Master Prime. The moment you have a candle in frame, or you have a little sun streak in the background, it starts blooming, and it affects the whole lens. So, in my opinion, the resolution of the lens can be less important than its contrast. And how did we change the contrast? Of course, with exotic glass, coatings, and advanced coating technology along the way.

In the film era, lens manufacturers increased the contrast of their lenses using coatings to create a greater perceived sharpness. As the state of the art advanced, new lenses made film look really good because it was the film itself that had a built-in softness because of the process it went through.

And then we got to digital...

Suddenly we started using those lenses on digital sensors where we don't have that loss. Actually, we increased contrast with the sensor itself. So, a lot of our images started to come back too contrasty, too sharp, too defined. And we wanted to move away from that. We started to use filters again, heavily, as you recall. I'm talking about 10 years ago.

And then we discovered that if you took really old lenses that at full open apertures have all these inherent problems with contrast and with falloff, you got a nice image with the digital sensor. So that started to turn the ship around. And it also started to turn the ship around for lens designers, because when they started to build the newer lenses, they had to really think about what they were going to do about contrast. If you look at some of the better lenses out there now for Full-Frame, the resolution is way up as well, but the contrast is what makes the difference.

So now we go back to vintage lenses. They are interesting, but not

Kees van Oostrum, ASC, NSC, SBC, AIC

Cooke Varotal/i Full Frame Zooms

for everything or for everybody. The problem with vintage lenses is the mechanics. They're usually very poor, are either worn out or were never good to begin with. So, then you start remounting and rehousing those lenses. Some people do a great job, and others don't do such a great job. You'll find that it's not so easy to build the mechanics around an existing lens, and only a few companies are really good at it. I think that the development of the classic vintage lens is wonderful. It has inspired us, and it also has told us, from a lens manufacturing point of view, that we had to revisit the way we thought about these lenses and went about our business. So that's it.

You have my attention. What's else is coming from Cooke?

Full-Frame Panchro/i Classic

We recently introduced the Full-Frame Panchro/i Classic prime lenses. The new Full-Frame Panchro/i Classics will cover a 43.26mm Image circle. The existing Panchro/i Classic 65mm Macro, 75, 100, 135 and 152 mm were designed for Super35, but they nicely cover Full-Frame as well.

I've always loved Cooke Panchro lenses. They've been my favorite go-to lenses at times for a specific look. If you talk about what are among the greatest vintage lenses out there, I think we must include the Speed Panchro [designed by Horace W. Lee in the 1920s]. And celebrating a centennial this year since the first ones were sold in 1921. But they were limited to Super35 until now.

Now we're offering the Speed Panchro look for Full Frame. It is kind of an ode to a classic lens that is specific. It's vintage, but it also is put together with a modern sensibility. The mechanics are much more rugged than the originals. Some of the vintage issues are resolved. The glass in the Classic is the same as the original; there's almost no difference.

The coatings are the same. My cinematographer colleagues might say, "Yeah, but I like the original vintage Panchro's better." So I did extensive tests with original vintage Speed Panchros against our new Panchro/i Classics. The difference in my opinion is negligible. The difference that remains is that the old Speed Panchro's are usually a bit warmer and sometimes tend to be a little bit softer. Why? The fact is that those old lenses are more than 50 years old, and the coatings have disintegrated, become yellow and of course, there's dust in the lens that gives it what I call a classic patina. So I'm looking at being able to give you something to add to the rear of the lens if you want that classic patina. But I tell you, honestly, I yet have to find a vintage Speed Panchro that I couldn't match

with the new Panchro/i Classic.

Remember, also, over the years that the vintage Speed Panchro's were built, there were many changes in the manufacturing techniques. That's why, when people remount them, they prefer Series 3, not Series 2, and certainly not Series 1.

What is the maximum aperture? And will you rename the longer focal lengths Full-Frame?

Wide open is still T2.2 through 100mm. The longer focal lengths have not changed, but when we sell a new set, they'll all be called the Panchro/i Classic Full Frames.

Cooke Varotal/i Full Frame zooms

Please tell us more about the new zooms.

Kind of a milestone in my opinion with the introduction this year of the new Cooke Varotal/i Full-Frame zoom lenses: 30-95 mm and 85-215 mm. These are the first two and a wide-angle zoom will come out in the fall this year, approximately in an 18-40 mm range. They will all have a T2.9 maximum aperture.

Varotal: the first 35mm zoom I bought was a Cooke Varotal 20-60. Followed by 20-100, 18-100. Amazing—they were the only zooms at the time that didn't breathe. I loved those Varotals.

Me too. That's the first project I started when I joined Cooke. I said, "We need to provide zoom lenses again." I still have my 18-100 and 25-250 that are both in great shape. I'm not saying that these are the same lenses. The new Varotal's feature a totally new design, are much more advanced and, of course, Full-Frame. The name "Varotal" is a reference to the great zooms that Cooke once built. These new ones are fairly small and lightweight.

Candy Store for the Cinematographer

Jon, do you realize that Cooke Optics is currently manufacturing and offering between spherical and anamorphic and Super35 and Full Frame, one hundred and sixteen different lens options all designed for cinema? That's why I refer to it as the Cooke candy store for the cinematographer.

This has been a fascinating discussion. Congratulations on the new lenses. Thank you.

I'm enjoying what I'm doing. I took a love for lenses from over the last 40 years as a cinematographer and now I can share that with others.

Iain Neil, Cooke Chief Optics Advisor

Above: Iain Neil—lens designer, recipient of multiple Academy Scientific and Technical Awards, ASC associate member, SMPTE and SPIE Fellow, member of AMPAS and Optica—has been working at Cooke Optics for more than 10 years in the role of Chief Optics Advisor. He worked on the S6 series, better known as Super 35 Anamorphic/i Primes. Then came anamorphic zooms and the Full Frame S7/i series. And now S8/i primes. Iain's work at Cooke involved consulting and overseeing the optical design as well as working closely with the engineering team to develop efficient methods to build the lenses, particularly Anamorphics.

Doing an interview with Iain Neil is similar to Vittorio Storaro. Iain begins by asking, "Can I ramble on? Jump in when you want specific questions answered." Vittorio's interviews begin with a long dinner. "Three bottles of wine, no water," he commands. Discussions with Iain are like a graduate course in optics, illuminating and focused. This one could have gone much longer, were it not for the faltering endurance of a laptop battery on a Zoom video call.

Jon Fauer: How did your work on Cooke S8/i Primes begin?

Iain Neil: During the past five or more years, I kept hearing that images produced by digital cameras mostly looked the same, especially with spherical, also known as "flat," lenses. Yes, Anamorphic is different and Speed Panchros are different, but for regular spherical lenses on the majority of the cameras, the words "clinical, sterile look" were heard often. This seemed to be bothering a lot of cinematographers because they wanted to have a look that told the story and went with the movie while still being unique. Thinking about this, I said, "Well, maybe future lenses should be designed so that the images are more film-like, as opposed to digital." The question was how to do it? I started working with aspherical surfaces back in the 1970s for infrared optics. Then we had aspherical surfaces in cine optics around the 1990s. And those types of aspheres, unfortunately, took a direction where the imaging appeared clinical or sterile.

The focus in the past, with film, tended to be mostly about resolution and then contrast. But with digital, you can say there's a limit to the resolution that you need. We only need so much resolution because the camera won't see any more than a certain number of cycles per millimeter. In the old days, and the old days were maybe 15 to 20 years ago, people referred to cine lenses as showing, for example, 200 cycles per millimeter. Well, these days, even with the highest resolution digital cameras available, you're not going to see much more than 100 cycles per millimeter, and that's at the upper limit.

The point is that we don't need to be quite so obsessed with resolution. The key is contrast. In my view, you want to maximize the contrast. So, when the S8/i project began, I said, "We don't really need the aspherical surfaces—they are not magical. With spherical optics, you can design lenses that perform very well—maybe not to super high resolution levels, but certainly sufficient, and quite ample, for digital cameras not just today, but even in 5 or 10 years from now."

Spherical optics can do just as good a job as lenses with aspherical optics. Certainly there are trade-offs: size, weight, cost, supply chain. Many things about spherical optics look more attractive to a lens manufacturer. And the imaging, it turns out, can be made to look quite film-like.

What do you mean by film-like?

It refers to the look from a digital camera that looks more like film. This is the essence of what we were striving to achieve with the new Cooke S8/i lenses. S8/i have optimized aberration correction with the Cooke look built in for digital cameras. You as the cinematographer can establish your own look by adjusting the lighting, filtration, and other things.

Furthermore, in designing spherical lenses, you can produce a near telecentric output of the light rays that is nice for the sensor. It makes the sensor efficient. Remember that Cooke has a long history of making lenses for film, and then film plus digital. But now, we're talking about the new S8/i lenses where the emphasis is on digital, but you can still use them for film and on PL mount Super 35 reflex film cameras. So, we want to minimize lateral color or color fringing, (not on-axis, but around the picture) and reduce it almost to the point where there's none. You can do all this with spherical lenses.

Spherical lenses enabled a modular approach, both optically and mechanically, for the entire set of S8/i lenses. There are 16 focal lengths from 18 mm to 350 mm, the first 7 of which are here now the rest coming later in the year. The entire range, all spherical, all have the same, pleasing look. In other words, it's a matched series. The modular focus arrangement in the lenses and the modular mechanical design of the S8/i high speed lenses—which are T1.4 up to 135mm—means that you are really de-stressing, having less stress in your optical and mechanical design, which makes it, I don't know if the word is easier, but I think you have more chance

Iain Neil, Cooke Chief Optics Advisor

to realize a good consistent product and a product now that has what I would say is a film-like look.

There are additional reasons for not having aspheres, whether pressed, molded, polished, ground, or other methods. One of them is the alignment, how precise you have to align aspheres, and the fact that over time, you may lose the alignment. So then you have a servicing issue. The other issue with aspheres, especially when ground and polished, is the possibility of seeing "onion rings," or "tree rings" in the bokeh. It's not always the case, but it can show up. With spherical lenses, you have smooth-looking bokeh, without onion or tree rings.

Another feature of the S8/i lenses is that the control of the optical design is such that the bokeh shape remains the same for all the focal lengths. So, on-axis, you have circular bokeh, and as you go off-axis, you get what looks like a cat's eye. It's not a semi-circle or some unusual shape. The bokeh add to the pleasing look.

I worked on this for several years, looking at several kinds of optical designs. And then Cooke was interested in bringing out a new series of lenses. They had the S4/i, S5/i for Super35 and the S7/i series for Full Frame. But the S7/i are T2. You might say that you don't really need a faster lens. But there's one thing that's been happening lately. Fast lenses are not being used just for low light. It's not like the film days where ASA topped out at 500.

What seems to happen now, even when you shoot in daylight, is you add a lot of ND filtration and you open the lens to maximum aperture. And you're working with Full Frame image size. So, you have a very, very shallow depth of field. And that gets back to the look again.

All of these things go together: imaging, contrast, look, bokeh, shallow depth of field and resolution. How do you balance them? You want them all together, as a package. Then, on top of all this, you have the Cooke look. The Cooke look is, I think, familiar to most people by now. One of the nice results is having very good skin tones. It's very good with people, with actors and actresses. And so, you put all this together, and you do this in a lens series with spherical elements. So, that's the background of the new

Cooke S8/i series.

Were you responding to market requests and DP feedback?

Technology advances with lenses. But sometimes I feel as though designers see the new technology and then feel obligated to use it. In this case, I didn't feel that we should follow the technology. We found out what the customers wanted and what was their need.

We hear so much about de-tuning of lenses. And when you de-tune a lens, you're trying to take away some resolution or contrast or something. Here, I am coming at it the opposite way and saying, "Well, how do you tune the lens? How do you tune it for the latest digital imaging technology?" In other words, we started from scratch.

When did this begin?

The project, the concept, the incubation period, was generated over some years. It was Les Zellan, when he was Chairman at Cooke who said, "We want to do this because we should have a new flagship series of Full Frame lenses. Then, once you have the idea or concept, then you have to develop the product. Of course, Cooke has the optical and mechanical design teams, the manufacturing capacity, the testing, the supply chain—they have all these pieces.

Do the S4/i lenses have aspheres?

No, S4/i prime lenses have a slower aperture so have less need for aspheres.

When we talk about the Cooke look, can we say that these new S8/i primes match earlier Cooke primes?

Yes, but the S8/i Cooke look has been somewhat tuned for the digital sensor. The Cooke look has been defined. You interviewed Jon Maxwell a while back. But the Cooke look for digital needs an additional word. That word is "tuned." It has been tuned a little bit to suit the pixel size and what's going on with the digital sensor. If you take an S4/i Cooke lens and put it on a digital camera, it will work very well. I don't want to say there's more or less Cooke look, but I would say the S8/i has been tuned a bit more precisely for digital sensors than it was for film and it is consistent throughout

Iain Neil, Cooke Chief Optics Advisor

the S8/i lens range. When these lenses were being optically designed, they were done as an entire set, together. It wasn't one focal length, then the next, and the next, with different people doing different things. Everything was coordinated, all done in parallel.

Good point, because the S4 series were introduced in 1998. They were equipped with Cooke /i beginning in 2005. Additional focal lengths were added until there were 18 of them by 2012.

You mentioned that the earlier emphasis in the film days was on resolution and they were often trying to achieve 200 line-pairs. But film could not resolve 200 line-pairs. So why were they trying to strive for that?

That's a very interesting question that leads into an avenue with many side roads. When you look at a lens on projection, the human eye and the brain works well looking for resolution, but does not work well looking for contrast. If your reticle has 200 cycles per millimeter test targets or vertical and horizontal bars, or line pairs, the human eye will be looking at that. It will not be looking at, say 40 cycles per millimeter. And by the way, 40 cycles per millimeter is about 4K for a Super35 size image and about 6K for a 36 x 24mm full frame image size, depending how the pixels are added together. So, 200 cycles is respectively 20K and 30K. Unfortunately, projection these days is not so accurate now in terms of assessing a cine lens for a digital camera.

Why is projection not as good for assessing a cine lens?

First of all, you should not be looking at 200 cycles per millimeter. Ultimately, when you put the lens on the camera, I doubt, unless it's a military or government type application, that you'll be looking at 200 cycles per millimeter. It does make a difference when you're designing, building, assessing, and projection testing. Do you set various parameters of the lens for 200 cycles per millimeter or you do it for maybe 100 cycles per millimeter? It makes a big difference.

There's another thing about digital cameras. Remember with film, the light came out the back of the lens, and it hit the film emul-

sion. Actually, it hit one layer and then it went through and hit another and another. Now, the light comes out the lens and it goes through an optical low pass filter. Let's just say that it messes around with the light. In fact, it's one of the reasons you don't see 200 cycles per millimeter — because without the OLPF you may get moiré and aliasing.

Also, different from film, the sensor is composed of photosites with micro lenses and filters on each one. You have none of that with film.

When you put your lens on a standard projector, it does not usually simulate the effect of the OLPF, the color filters or the micro lenses on each pixel. All these come into effect when the lens works on the camera itself. If you have an optical low pass filter and you have a very fast T1.4 lens, the OLPF filter may introduce some spherical aberration. And what this means is it will drop the contrast a little bit.

But to play devil's advocate, I'm seeing a trend where some of the camera manufacturers are not using low pass filters anymore. For example, Blackmagic, Leica, Nikon and Canon. But perhaps another reason why the lens manufacturers in the old days were going for a higher resolution was because of the many stages from OCN (Original Camera Negative) to intermediate, interpositive, internegative to a release print that probably bounced around in the projector's gate?

Typically, if you just do a contact print, without the rest of the process, you're going to see somewhere between 60 to 100 cycles per millimeter. If you want to go to 200 cycles, you've got to go to a black and white film stock used for reconnaissance, but you're unlikely to get there with color film.

So, what's the reason why, in the "old days," were they were striving for 200 line pairs?

Marketing.

Wow. So, how would you compare the look of the new FF S8/i

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T1.4 to the original high speed S35 5/i T1.4 (September 2009) and FF S7/i T2.0 (April 2017) in terms of look?

I think the best way to answer it would be to take an S8/i and say, "Let's stop it down to T2." And then I would say it looks quite similar to the S7/i. Maybe not exactly, but quite similar. The difference would be then at full aperture, wide open, and at full aperture with the S8/i, I believe you will see a more film-like look because of the contrast and resolution balance. I'd say the blend is more modern. Even though S7/i is only a few years old, already things have moved on. There are changes in the technology and what people want. The S7/i were lenses designed for digital but still thinking about film. It's a bit like the S7/i were giving two points to film and one point to digital. With the S8/i, it's like two points to digital and one to film.

And two points for Harry Potter's Gryffindor and one point for Hufflepuff.

With the 5/i series, it's really the similar story. I don't want to make it sound that this is a firm spec, but they were really designed for film. It doesn't mean you can't use them for digital, but they are earlier designs than S7/i.

Right. The Super35 5/i T1.4 primes were introduced in September 2009, at the same IBC show where the first ARRI cameras code-named ALEXA were launched. Those were indeed early days of digital.

That was the beginning of thinking digital for cine lenses.

I think another advantage of the S8/i series is that they're lighter and smaller, which is a big deal now.

Well, I would say that is very compelling. It is a trend not just with cine optics but with cameras as well. Some of this has been pushed along by drones and gimbals and stabilizers. But the trend is towards a bigger image size: Full Frame. That can make lenses larger, heavier, more complicated, more expensive. I know people say, "Oh, but there's no reflex mirror in these cameras. You can push the lens closer to the sensor." But they're still going to trend larger, heavier.

Cooke has been designing lenses to accommodate a reflex mirror since the S4 was introduced, basically, for ARRI PL mount cameras with a 52mm flange focal depth. And the S8/i actually can still do that. But there was an emphasis here as well to make these lenses more compact and lightweight. The optical designs took that into consideration with the configuration, the structure, and the focus groups. If you only get one focus group moving or one lens element moving, the mechanics are usually simpler than having two or three elements, or two groups of elements, move.

The optical design, following on with the mechanical design, put a lot of emphasis on the size and then the weight. The primary thing was to do with diameter and length. In fact, most of them have a 104mm front diameter and are 157mm long.

Hang on. I remember a discussion at the beginning of the Full Frame wave, and an optical designer named Iain Neil said, "Oh, but they're going to have to be twice as big and twice as heavy." But with the S8/i, you refute that argument, in a good way.

Actually, what happened was I spent about three years doing a feasibility study on my own. I asked, "What can we do with spherical optics these days with the new glass types, using the most modern optical design software? What can we achieve?" The result of that is why I would now say my earlier comment has been revised.

For example, compare the Full Frame S8/i T1.4 front diameter of 104mm to a Super35 S4/i T2 at 110 mm. The slower, older Super35 lens is even bigger than your new Full Frame lens.

Well, yeah, but remember, the S4 was 24 years ago. That is a long time.

What are some of the innovations in design or manufacturing that made it possible to make the S8/i much lighter and smaller?

You do statistical analysis of the tolerances and manufacturing errors. So, you can push the design envelope much further. In the old days, you wouldn't always know what to expect until you finished actually building a lens. The software, design techniques, and modern analysis all mean that you can accurately predict how lenses will perform before you build them.

I assume that the S8/i lenses can be delivered much faster than Cooke traditionally has been able to get lenses to customers?

Yes, they should be. If for no other reason than the lack of aspheres. A lot of other things have changed at Cooke. But if for no other reason, not having aspheres makes a huge difference—it's a large factor. In designing earlier lenses at Cooke, they always said, "See these damned aspheres. They're a bloody nuisance. They're difficult to source. Then we get them, and they're not the right quality. They charge lots of money. We can't get the volume. We can't build enough lenses." So, the word was out, get rid of aspheres.

And that's what got me thinking. The window of opportunity has shrunk from 10 years to 2 or 3. So, if you can't build enough lenses because of aspheres, in three years you'll be overtaken. The market will change: the lenses, the cameras, whatever. So, getting away from aspheres means you can produce more and get it out in a shorter time. That's happening all over in the world. That's how it's now working.

Is there a definable difference between what you call a "film-like look" and "Cooke look?"

No. The film-like look includes the Cooke look. It's combined. As we discussed earlier, the Cooke look got a little bit more precisely tuned for digital sensors because it hadn't been done before. The residual aberration, contrast, resolution, the whole way the image looks, that's blended with the Cooke look. And it's even blended with the fact that the camera has a little bit of filtration with its optical low pass filter.

Someone once said in FDTimes that a lens is a compromise of many things: focal length, speed, size, weight, cost, look. That is always the case. We don't want to make the lens too small, too compact, too lightweight because that could make it very difficult or impossible to build the lens at a reasonable price. It's a balance, more than a compromise. Blend is perhaps a better word because compromise sounds to me like something made by a committee where nothing's very good, whereas blend sounds as though you've done something good. I think what we did with S8/i is a very good overall blend.

RED V-RAPTOR Design

Bottom

Rear

Top

Welcome to the RED V-RAPTOR installation in the FDTimes Design Collection. Inspiration comes from the Museum of Modern Art; Good Design Marunouchi, Tokyo; London Design Museum; The Red Dot Design Museum, and users like you, worldwide.

Design is something MoMA has been asking about since its inception: What is good design and how can it enhance everyday life? The Bell-47D1 two-seater bubble helicopter, designed by Arthur Young and launched in 1945, is in the permanent MoMA collection. Its unique design included an acrylic plastic blow-molded cockpit, formed from a single sheet of polymer film.

The Olivetti Lexikon 80 typewriter was an icon of good design in 1948, "unifying the machine's many working parts within a sculptural and visually balanced outer casing." Olivetti's Lettera 22 portable typewriter arrived in 1950 and travelled with William F. Buckley, Jr., Fidel Castro and Bob Dylan—separately, of course. The Italian Fiat Cinquecento car, steel body and fabric top, was $52 \times 52 \times 116\frac{7}{8}$". Fiat designers stripped it to the basic essentials. The result, in 1957, was a cute car of "sculptural, functional delight."

Sculptural, functional, delightful. What better words for a form-functional camera of very good design that can enhance the everyday lives of cinematographers? The RED V-RAPTOR is an 8K Full Frame (VV) or 6K Super35 or 3K Super16 cine camera. It weighs just 4.03 pounds and at $4.25 \times 4.25 \times 6$", is about 10 times smaller in height and width than the aforementioned Fiat Cinquecento. There are many things to love about this camera. Three things catapult the V-RAPTOR into the FDT Design Collection right away:

1. The lever-locking RF Mount. 2. Clear labeling all over: every threaded socket, every connector. 3. Attention to detail and working with Creative Solutions on accessories.

V-RAPTOR's RF mount is familiar to Canon R-series camera users. But its lever lock is unique to RED. First, you mount the lens with the standard bayonet clock-to-lock mount. Next, you rotate the secondary breech lock clockwise to cinch the lens in place. This keeps lenses from twisting and provides extra support for heavier ones. The RF mount has a flange focal depth of 20 mm. The inside diameter of the mount is 54mm. So, this means you can use almost any lens on the planet with RF lens mount adapters.

RF Mount unlocked

RF Mount locked

Wooden Camera RF to PL Mount adapter

RED+Creative Solutions Accessories Design

Right Side Bracket

Base Anti-Tip

A-Box Audio Inputs

Left Handgrip

Top Handle

Right Handgrip

Expander Blade

ARCA Swiss Plate

Left Side Bracket

V-Mount Advanced Adapter

Gold Mount Advanced Adapter

Top Plate

Quick-Release Baseplate

Dovetail

Greg Smokler at Creative Solutions, said, "The amount of contouring of surfaces is beautiful, sculptural, and practical. It's useful; it doesn't snag on your shirt. It's not ornamental. It has purpose." Jarred Land at RED said, "When Dominick Aiello went over to Creative Solutions, it was like this magic moment to get designers Matt Tremblay and Dominick together to create a dream team doing the V-RAPTOR Accessories."

Here is the result, a collection of V- Raptor accessories—made of 7075 aluminum, intelligently designed and machined, comfortable and useful and sculptural.

DSMC3 RED Touch / SmallHD 7.0" LCD Monitor

The DSMC3 RED Touch/SmallHD 7.0" LCD Monitor attaches to the top of the V-RAPTOR and connects with pogo pins.

The nice design touch of this touchscreen monitor is how it migrates to other positions on the camera. It connects with a locking USB-C style DSMC3 RMI Cable for video and power. No additional SDI or power cables are needed and there are various cable lengths. You can attach the monitor at the back of the camera if you're on a fluid or geared head, or totally detach it and tether at a distance.

The 1920 × 1200 touchscreen display also has full control of the V-RAPTOR's Menus and includes familiar SmallHD PageOS tools like pixel zoom and waveforms.

V-RAPTOR in KOMODO Mode

Cinematographers who like to film from the hip or waist, KOMODO or Hasselblad style, can twist the DSMC3 7.0" around 180 degrees and fold it back along the top. Be sure to keep the air vents clear.

RED V-RAPTOR 8K

Good design includes the sensor. V-RAPTOR's new sensor has a read-reset time that is half that of MONSTRO. The sensor is 40.96 x 21.60 mm (46.31 mm diagonal), 8K (8192 x 4320), which is about 35.4 Megapixels per frame, and it can deliver up to 150 fps in 8K 2.4:1 widescreen format.

IDX ZEN-C98G
Gold Mount Battery

Gold Mount
Advanced Adapter

RED V-RAPTOR RF Mount and EF Mount Adapters

RED V-RAPTOR has an RF Mount that accepts the latest Full Frame mirrorless Canon RF series lenses—like the superb Canon RF100mm F2.8 L MACRO IS USM shown here.

It focuses to 1.4x magnification at a close focus distance of 10.2" / 0.26 m.

Additional amazing Canon RF lens designs include:

- RF 28-70mm F2 L USM (maximum aperture of F2).
- RF 85mm F1.2 L USM.
- RF 1200mm F8 L IS USM telephoto for $19,999.
- and many more.

But, if your collection of cherished glass includes a lot of EF lenses, fear not, Canon's assortment of RF to EF adapters fit V-RAPTOR:

- Standard EF-EOS R.
- Control Ring Mount Adapter EF-EOS R.
- Drop-In Filter Mount Adapter EF-EOS R with Drop-In Circular Polarizing Filter A
- Drop-In Filter Mount Adapter EF-EOS R with Drop-In Variable ND Filter A (shown below).

RF Mount with
Canon RF100mm F2.8 L MACRO IS USM

Front side of Canon EF-EOS R Mount Adapter with Drop-In Variable ND Filter. (Note Canon's terminology EF-R; FDTimes and RED would call it RF-EF: the camera end comes first.

Rear side. Note, there are contacts on the 12 RF side and 8 pogo pins on the EF side.

RF to EF Mount Adapter with
Canon EF 70-300mm f/4-5.6 IS II USM

Vocas PL and LPL Support for RED V-RAPTOR

Vocas RF-to-PL Adapter

Vocas RF-to LPL Adapter

Vocas Lens Adapter Support

Vocas Walnut Wood Handgrip

I like the Vocas RF-to-PL and RF-to-LPL adapter supports for RED V-RAPTOR because they provide extra strength to the mount by attaching directly to the camera body with four ¼-20 screws. You don't have to support the mount from rods or rails. Note that the PL or LPL mounts themselves are not included with the support and can be purchased separately.

RED V-RAPTOR Lens Adapter Support. Vocas #: 0900-0035. List price: € 239. *vocas.com*

The Vocas walnut wood handgrips are especially designed to fit directly onto the RED V-RAPTOR wing grips. Thanks to the symmetrical design, the handgrip can be mounted on either side of the camera on both the RED V-RAPTOR and KOMODO.

The handgrips are made out of walnut wood, which feels luxurious and is very durable in use. List price: € 89

Vocas Level

Quintus Horatius Flaccus (Horace), the Roman poet who lived from 65 to 8 BC, said, "When things are steep, remember to stay level-headed." Was he referring to a progenitor of the Cartoni fluid head and keeping your camera's horizon level?

Horace was the inspiration for the Michelin Man's name, *Bibendum*. Nunc est bibendum, nunc pede libero pulsanda tellus (Now is the time to drink, now the time to dance footloose upon the earth. *Odes*, 1.37) After all that drinking and dancing, it is no wonder why level was important to Horace.

The new Level Marker from Vocas is one of those attentive-to-details, inexpensive, little things that can make a big difference in cinematography. Screw the Vocas Level Marker onto any camera's

top handle. It is easily more secure and accurate than any hardware store level that I have double-sided taped to cameras.

Early in my career, the film editors at National Geographic kept complaining that my horizon was often off-level. If only I had a Vocas Level Marker attached with its ¼-20 (¼") thread while hanging off the face of a mountain. There are two things I learned from Nat Geo. Keep your vistas level. And keep adjectives out of the narrative.

The Vocas Level Marker is very compact: only 20 x 25 x 9 mm / .79 x .98 x .35", making it easy to keep it attached your equipment all the time.   List price: € 39. *vocas.com*

John Brawley, ACS on *The Desperate Hour*

John Brawley, ASC on *The Desperate Hour* with Blackmagic URSA Mini Pro 12K cameras.

The Desperate Hour *is one of the first features where a Blackmagic URSA Mini Pro 12K was the "A" camera. Actually, there were four URSA 12K cameras on the film. Cinematographer John Brawley, ACS discusses cameras, lenses, lighting, equipment and more.*

Jon Fauer: Please tell us about the backstory of your work as DP on *The Desperate Hour.*

John Brawley, ACS: Our location was in Northern Ontario, Canada. It was during the height of COVID. They had just established the first return-to-work COVID rules, it seemed like a good film at the time to do, because there was only one main actor and it was in a rather remote part of Canada. We were also outside. It was a small crew. I have to confess that I spent longer in quarantine than I did filming the entire movie. We did the movie in just 13 days after I was in quarantine for 14 days.

It's a proper indie film. I think Phillip Noyce, the director, wanted to do it, and Naomi Watts was committed as well. We all just wanted to go back to work, and it seemed like the right project at the right time. But it was my first COVID protocol movie, when we were working out all the things we take for granted now in terms of COVID safe working conditions. It's deceptive, because when you first read the script, it seemed like, "How hard can it be, it's mostly just one actor."

Probably very hard.

Yes, it was really hard, because to figure out how to shoot drama scenes at the level of performance that she had to do running, and even just from an acting point of view, that's really hard to do, to not be out of breath or seem out of breath enough that you're acting out of breath, but still have a performance that reads to the audience, to be able to do that performance, is incredibly difficult.

And then, if you start thinking about the logistics, because it's a near real-time movie, how on earth are you going to make video village work over a huge distance in the forest with a moving set? Naomi spent her quarantine training, distance running every day and she started getting some very fast times. She was the only one who actually was really fit. The rest of us were slovenly in comparison. She was running a lot, trying to get her stamina up, and she was also in quarantine. She had a treadmill on location, and she was running every day to stay in shape and be able to do the work.

None of us crew did, of course, and she showed us up very quickly. I had to do a couple of scenes where I was hand-held running, jogging backward with her, and I was knackered. I'd lasted two and a half takes of one of them, and then I couldn't do it anymore; my legs were so tired. And I literally had to go and have physical therapy, because I just wasn't prepared. That was

John Brawley, ACS on *The Desperate Hour*

Naomi Watts in *The Desperate Hour. Photo: Sabrina Lantos. Courtesy of Vertical Entertainment and Roadside Attractions.*

my own silly fault. Sometimes I had grips running alongside with bounce boards, and they would only last a take and then they'd have to swap out. And she would move back and do another take. She really showed us all up in a humiliating way.

Now it's time to tell us about the camera, please.

It was the Blackmagic URSA Mini Pro 12K. Actually, four of them. I thought the 12K could be good because it was a daylight film, I knew we wanted a small camera, I thought the extra resolution would help with stabilizing, and I'd already shot a pilot with Phillip where we used the previous Blackmagic URSA G2 4.6K cameras, to do the whole pilot as an A camera. I knew he wasn't afraid of trying something out like that, but I did test it in advance.

We made a DCP and screened it in the local cinema in North Bay, the little village where we worked. I love doing these as blind tests, and everyone liked the 12K very much. Because the budget we had was so modest, we would only have been able to afford one traditional camera package and a set of lenses. However, with the URSA 12K, we could get four camera bodies basically for the same price. So, we had a hero A-camera body that could live on the head, a B camera that was rigged in studio mode with an Optimo 24-290. A third camera was there for a splinter crew to go do inserts with doubles. Phillip generates a lot of insert coverage

as he goes. That gave us a lot more flexibility than having just the one camera. And the fourth camera was there as backup. I also had an early prototype of the RAWLITE OLPF.

The 12K resolution was a plus because we knew that sometimes we were probably going to have to stabilize a shot, even with a stabilized head. The other cool thing is that the 12K camera can work in 8K mode without losing any field of view, no crop An advantage is that the rolling shutter read-out time is halved. I'd have to check the numbers, but in 12K it's about 15 milliseconds, and in 8K it's half that, about 7 to 8 milliseconds. For intense action scenes, especially if we're in profile or panning through trees, the rolling shutter in 8K mode helped to eliminate skewing of the verticals. If we were leading ahead of Naomi from the back of the e-bike, we'd leave it on 12K, but if it was profile, panning, we'd go to 8K.

What codecs/compression settings did you use?

I used the Blackmagic RAW Constant Quality "Q" settings compressions. As you know, the camera offers Constant Bitrate (5:1, 8:1, 12:1 and 18:1) and Constant Quality, which is a variable bitrate that maintains the same image quality (Q0, Q1, Q3, and Q5).

I recorded most of it at Q3 because Q3 at 12K is about a terabyte

URSA Mini Pro 12K with ZEISS Supreme Prime, Cine Tape, Wooden Camera D-Box, Anton Bauer battery.

an hour. (If you shoot ARRIRAW on an ALEXA Mini Super 35, it's also about a terabyte an hour.) Q3 looks fantastic.

It sounds more confusing than it actually is. In Constant Quality, the bit rate floats, with a bracket between low and high. Blackmagic compression is interesting. It's not based on motion; it's based on what's in focus. So, if something is out of focus, it uses less data, and if it's in focus it uses more data. So it's not based on what's moving, it's based on the sharpness of the image, essentially. If you have a wide shot at T8 on Q3, it's going to use the upper end of that band or data rate, and if you had close-up of someone at T2 with their face taking up 30% of the frame, and the rest of it was an out-of-focus, beautiful background, it will use a lot less data. It was interesting to realize and work that out. But I never really felt like I ran into the wall with the compression itself.

What would be the difference in data rates and recording times? You said Q3 gave you about a terabyte for an hour?

If you were to use fixed, 3:1 Constant Bitrate, it's around 3 or 4 terabytes an hour. In theory, Q1 with a very detailed scene, consumes even more. But most of the time, in practice, some stuff's in focus and some isn't, so usually a lot less actually. The Q rates are interesting because I find that you really can't see

much of a difference because of how efficiently it compresses. I'm amazed at how Q3 looks.

The colors were beautiful.

It is unique the way the sensor works. That was another reason I thought it would probably be a good match. We were shooting in the fall, also known as autumn if you're an Australian, and we knew the colors in the forest would be a big part of it. The production design was largely location choices, and it was also very much a character as well. We were really careful about choosing the right locations at being there at the right time of day when the light looked good, and so we had a camera that could do that nuance and subtlety justice, because there are some beautiful autumnal colors in that forest.

The vibrancy of the colors offers an extra layer of texture.. Especially when you're grading, it feels like you see a lot more subtlety. When you're looking at Naomi's face, you can see the sky color reflected in her forehead.

What LUT were you using?

I just used the default in-camera Extended Video LUT. It carried through to post at Technicolor.

John Brawley, ACS on *The Desperate Hour*

Pocket Cinema Camera 6K Pro with Canon 24-105 mm f/4L IS II USM.

ARRI SXU wireless iris control unit powered with Wooden Camera D-Box.

Were you shooting at 24 fps?

Yes. 24 fps, Q3, 12K and 8K, with a full set of ZEISS Supremes and Angénieux Optimo 12x 24-290. Also, we had another camera that hadn't been announced yet, the new Pocket 6K Pro. I had a pre-release version. There are inserts of Naomi holding her phone and most of those were taken with the 6K Pro using a Canon 24-105 mm image stabilized lens. The image stabilizer is pretty good and I would just run along behind her, handholding the camera, and trying to shoot the phone for those inserts.

Even at 24 fps and lots of running, it was smooth, not jittery.

With Naomi running and moving up and down in the frame, we would just back her off a little bit and frame a bit looser. We composed for an aspect ratio of 2.39:1 and recorded the full 17:9 image area so we had extra room at top and bottom to reposition in post if needed.

Were you riding exposure on the URSA 12K as you were traveling along?

Yes. I had a separate ARRI SXU wireless iris control unit. We powered everything on the camera with a Wooden Camera D-Box. It provides lots of accessory connectors and also remote start-stop for the camera.

You mentioned Supremes?

When I first got the URSA 12K, I thought, "Well, I guess I need a really good lens set." The Supremes had only been recently announced. I didn't ask for them specifically but CVP had a demo set and they suggested I might like to try them. When I shot with them, I think I attributed half of the beauty of the footage to the URSA 12K camera and also as much to the lenses; they're just very nice looking.

On the URSA 12K, I find they have a very interesting look. The Supremes look beautiful on other cameras as well. The show I'm doing now is a Renée Zellweger limited crime series called *The Thing About Pam*, and I tested the Supremes.

Compared with other lenses at the same aperture, same focal length, the Supremes seem to fall-off faster. You can see that the bokeh and the focus fall-off are vastly different. And that's when I felt that the URSA 12K had a kind of large format look, even though it's a Super35 camera.

Could it be a result of the 12K sensor, with its 12,288 x 6,480 photosites in an area that measures 27.033 mm wide x 14.246 mm high? The pixel pitch is approximately 2.2 microns. If we multiply by 3, as Leica's optical designer Peter Karbe suggested, that gives us a tiny circle of confusion (CoC) of 6.6 microns compared to the previously accepted 20 to 25 micron CoC of many other cameras. That might contribute to the shallower perceived depth of field as well as the famously gentle focus fall-off the Supremes.

Could be! I'm almost wary of talking about a large format "look" but they are very special. I bought Supremes from CVP after I did that initial 12K test because I like the lenses so much and I appreciate that they're quite small. They're quite fast at T1.5 and not that expensive for high-end lenses. They're quite affordable. It's such an interesting market where lenses are going at the moment.

Do you usually buy your equipment from CVP?

They're in the UK and I was filming *The Great* there at the time. We rented through ARRI and they did a great job looking after us. They just didn't have any Supreme Primes at the time because it was so busy. So, there's a fellow Australian at CVP named Aaron George. I know him from when he was an AC and then camera technician at Panavision Australia. Then he moved to London as head of camera service for ARRI in the UK. For the past 4 years or more, he's been at CVP and runs the Creative Space in Fitzrovia. During prep, we caught up with Aaron. I think we were having lunch together, discussing lenses, and he said, "Just tell me and I'll arrange for whatever lenses you'd like to test."

Aaron is among the nicest and most helpful people in the business.

John Brawley, ACS on *The Desperate Hour*

URSA Mini Pro 12K with Angénieux 12x 24-290 zoom, Duclos handle, ARRI ZMU zoom control, OConnor 2575 , Cine Tape.

He is. Anyway, Aaron got me a set of Supremes to test, and I liked them so much I ended up buying some.

I also bought an SRH-3 ARRI Stabilized Remote Head from Camadeus. I had used a Ronin 2 with Master Wheels as a low cost and tiny, great, stabilized remote head. But, and then COVID happened and then everyone went nuts for remote heads because of the new protocols around reducing the number of people near the talent. The beauty of the ARRI SRH-3 is that it is so durable and the motors are so strong that I've had a full-size Alexa SXT with a 24-290 zoom on it!. But it's still a really small head. It does not really require a tech. I used the head a lot on *The Desperate Hour*. I love that it's such a small head, but so powerful in terms of what you can do with it.

I've always wanted to own an ARRI geared head. One of the first things I bought when I became a freelancer was a CP Mini-Worrall because I wanted to learn how to use wheels, because I couldn't afford an ARRI head.

You can put the SRH-3 stabilized head on a dolly. It's not that fussy, you don't need dance floor or tracks as often. You can do more intricate moves and it's very liberating. On "The Desperate Hour" as you know, the Naomi Watts character runs during

most of the movie. There were a lot of conversations about how do you shoot drama scenes where someone's on the phone, acting, talking, running, and you're never editorially leaving the conversation. Naomi is very super-fit, and these were ten-hour days, but she's not running the whole ten hours. You're only going to have a few takes before you exhaust her. The SRH-3 became an important tool for us.

We did a lot of it with the SRH-3 remote head mounted on a Flowcine Black Arm, or a custom-made vibration-isolating arm from William F. White in Toronto, on the back of a Grip Trix electric vehicle and an e-bike. We had a very good bike rider, who is a former motocross champion. He said it was a challenge because Naomi could run quite fast. But sometimes she was running just slow enough that the bike became top heavy with the head arm arm on it, was right on the edge of like stalling and would want to fall over.

The progression of the story starts off in an urban environment; she's on the road, then on an asphalt-like a bike path, then on tracks that are more like dirt roads, and then it just gets more and more wild. It was easy on the paved and dirt roads, but then it starts getting really complicated on the hiking trails that are only less than a foot wide and you're kind of weaving between trees.

John Brawley, ACS on *The Desperate Hour*

URSA Mini Pro 12K with ZEISS Supreme Prime on ARRI SRH-3 Remote Head.

The bike was really good for that. Probably 70% of the movie was done with the ARRI SRH-3 remote head and the rest was with long lenses on tripods at the side of the tracks and quite a few setups that I did hand held as well.

What were the logistics of video village and so on?

When you think about how the logistics worked, Phillip wanted to be able to talk to her, he wanted to be able to see an image, so how can that work when you're on a bike? How do you make the whole video village circus happen, and how do you do it in a way when you have a limited budget and a limited schedule? Those were the big issues for us.

The locations became really important to us. For a while I was toying with the idea of maybe using a helium-filled inflatable cloud, attach it to the vehicle and tow it behind while I'm shooting. And then, you look at the environment, it's a forest, you know there's no way you're going to tow anything, it was ridiculous. So mostly the lighting was driven by time of day. We did a lot of work in pre-production to schedule for the time of day and the direction of shooting

Phillip wanted a progression of going from an urban environment into a more and more remote wilderness, *Heart of Darkness* kind

of vibe, where it becomes more and more wild. And then she has to emerge from that as well. Because it plays in real time and we never leave her, the lighting was done through very intricate scheduling and planning with the location scouts. We of mapped that out, and a lot of the time we would switch locations based on what the weather was going to be as well. Naomi was great at jumping to a different scene at short notice.

Was the e-bike camera looking ahead of Naomi or looking backwards?

Backwards, most of the time. Sometimes we did follows, rigging it on the front of the bike.

When you're leading her, how is the camera and SRH-3 Head attached?

The head was usually underslung from a Flowcine Black Arm rigged to the back of the bike. The wireless video and the receiver for the controls was off to the side. The great thing about the ARRI head is that the wireless protocols work from what seemed like a million miles away. We never have trouble with the range, and it is very simple and quick to set up.

What about lighting?

John Brawley, ACS on *The Desperate Hour*

ARRI SRH-3 remote head with vibration isolating Flowcine Black Arm on Zero FXS Electric Motorcycle.

There's a great French company called Ruby Light, I think they're distributed by K5600 in the U.S. Essentially, they're an LED strip sewn into fabric. I think if you go rubylight.fr, and they're named after... They're basically long, soft, flexible LED bi-color ribbons—waterproof-ish, with Velcro and magnets to attach diffusion and modifiers. I strapped some Ruby Lights on the base of SRH-3 as a bit of an eye light, a little bit of fill.

Where were you operating the remote head?

We would be up ahead, sometimes. And then, I kid you not, we ended up renting a Tesla as the director's video village when we were on paved roads. It was quieter; you only had the tire noise. The noisier gas-powered vehicles would be way ahead in the convoy.

Makeup, hair, and the rest of the procession would travel further ahead. To get a take going would take about 30 minutes because you had to have the right order of vehicles, often the road was only wide enough for one vehicle, so you'd have this convoy and then the last vehicle would typically be the Tesla with Phillip in it. But we also had a focus puller, a script supervisor, and so on, we'd spread it across a couple of vehicles as well, and the electric ones were the ones that were closest to the camera.

Anyway, I, or my A/Steadicam operator Yoann Malnatiwas operating off a Small HD 17-inch monitor, sitting at the base station, often on a Grip Trix type electric vehicle. My focus puller was riding alongside. We had ARRI WCUs. That's another good thing about the ARRI head: it integrates nicely with the other ARRI accessories.

In summary?

The story for me was, "How do you shoot a film with only one protagonist, in real time, and she's running for 85% of the film, and you never cut away to the other side of her phone call, you only hear the other side of the phone call."

Since you did *The Desperate Hour*, Blackmagic Camera Update 7.7 came out. Comments?

I actually have tested 7.7 firmware extensively and it's a major improvement over the previous 12K firmware, especially with regards to the way the camera processes the unique RGBW sensor. The demosiac is substantially improved and this for me has meant less noise and a lot less chroma moiré on super fine detail. Once you combine it with the OLPF from RAWLITE, it's really maturing into a solid performer image-wise.

Rawlite OLPF for Blackmagic URSA Mini Pro 12K

Rawlite makes Optical Low Pass Filters for Blackmagic cameras that replace the sensor's existing IR blocking filter. The Rawlite OLPF specifically designed for the Blackmagic URSA Mini Pro 12K prevents moiré while still preserving the fine detail that this camera can capture.

In addition to blocking near-infrared wavelengths with its anti-reflective coated hot mirror (dichroic filter), the Rawlite OLPF reduces aliasing and moiré that might occur.

Many digital cinema cameras (including ARRI, SONY, RED, CANON) have OLPFs (also known as an anti-aliasing filters). Some are swappable, others are fixed. Recently, as resolution increases and the sensor's photosite size gets smaller, some companies have avoided the OLPF entirely: Leica, Nikon, Canon still cameras.

You also hear the term cover glass. It covers and protects the sensor and may be an OLPF or it may be just an IR blocking filters. Even without an OLPF, the cover glass most likely will still have the IR blocking filter, aka IR-Cut, aka Hot Mirror.

Because the URSA Mini Pro 12K has a resolution of 12,288 x 6,480, and a pixel pitch around 2.2 microns, the chance for moiré is less than a camera with bigger photosites. But if you're filming an actor with a checked shirt and Harris Tweed jacket, you still might see a dreaded moiré pattern. John Brawley adds, "Typically the URSA 12K resolution is so high when shooting 12K native that you don't notice it much unless you really go looking. URSA 12K at 8K and 4K modes becomes slightly more prone to moiré," like most cameras of those resolutions.

The original IR absorption filter of the Blackmagic URSA Mini Pro 12K does not have an OLPF. But, Blackmagic made it easy to change the filter. Remove it by unscrewing three little screws. Use the magnetic screwdriver that comes with Rawlite's OLPF kit.

After removing the filter the Rawlite OLPF can take it's place.

The Rawlite OLPF is slightly thicker than the original IR filter. Therefore, a shim is needed to correct back focus. A 0.3mm shim is included in the kit, as well as tools needed for installation. Rawlite Optoelectronics OLPF, shim and tools: $435.00

I talked to Hans Hijmering, filmmaker and maker of Rawlite OLPFs.

Jon Fauer: Please tell us about your work, how you decided to make these filters, and how it started?

Hans Hijmering: We are professional photographers and filmmakers. In our work of event (live theater) recording, we learned that traditional broadcast cameras struggle with the high
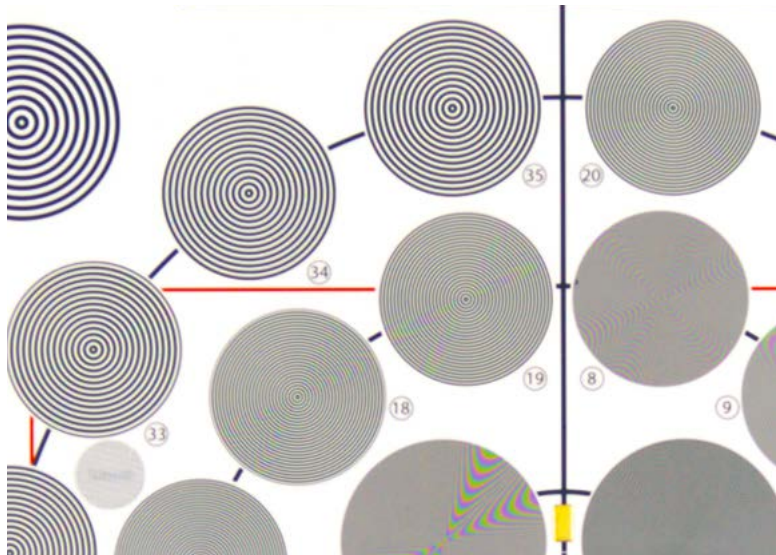
Hans Hijmering on Rawlite OLPF for URSA 12K
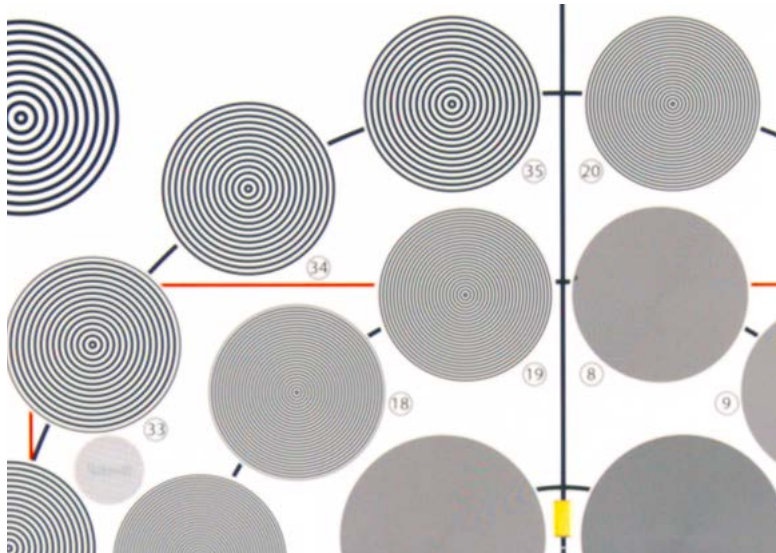
12K Q0 Blackmagic Raw 24 fps 320 ISO. *Above*: URSA 12K with Rawlite OLPF.
Below: URSA 12K with original Blackmagic cover glass. The effect is a gentle smoothing of super-fine detail, less fear of aliasing, slight decrease of IR blue. Don't be alarmed by the charts, you're not usually filming charts in real life.

contrast of theater lighting—lighting that's designed for a live audience, not for camera.

When Blackmagic released their first cameras, the Cinema Camera 2.5K and then the Pocket Cinema Camera, we were immediately pleasantly surprised by the organic (yes, film-like) feel of the image. There were drawbacks, of course, among them were moiré and IR pollution. Convinced as we were of the potential of the Blackmagic cameras, we started studying ways to overcome these issues. This was the start of the development of the Rawlite Optical Low Pass Filter (OLPF).

What actually is an OLPF?

An OLPF consists of birefringent crystal layers that split the light with a precisely determined offset. This is far more precise—and therefore more detail preserving—than simply blurring the light. It hands the demosaicing algorithm just the right information to avoid unnaturalistic "surprises" like moiré and aliasing. Because precision is key, OLPF design is sensor specific.

We've also incorporated an infrared absorption layer and very effective anti-reflective and infrared-cut coatings. The latter eliminates the need for expensive IRND, and/or different diameter filters in front of the lens. Our blue/green IR absorption layer is very well protected against corrosion due to moisture (sometimes referred to as fungus).

Does the OLPF slightly diffuse the image?

"Diffusing" — like "blurring" – might sound like uncontrolled spreading of the light. The underlying question is "does the image loose detail?" An OLPF passes the amount of detail that the sensor can handle; no true detail is lost. It takes away the digital edge of the image, making it appear more natural.

Why do you think Blackmagic skipped using an OLPF?

It's really up to Blackmagic to say. Each sensor needs it's own specific OLPF. Maybe they wanted to leave it up to a company like us at Rawlite to provide OLPFs to users who desired them :)

rawlite.com

Blackmagic URSA 12K Anamorphic Menus

Atlas Lens Co. Orion Anamorphic Primes

For Blackmagic URSA Mini Pro 12K and other Super35 cameras, the 7 Orion 2x squeeze S35 Anamorphic primes are an excellent choice. Their 31 mm image circle covers traditional Super35 anamorphic 1.33:1 image areas up to 24.89mm wide x 18.66 mm high. (Although with a 2x squeeze ratio and a 2.39:1 release, the actual aspect ratio is 1.2:1.)

The Orion primes cover Full Frame formats edge-to-edge with the Atlas 1.6x LF Extender attached to the PL mount. (LPL-to-PL also available. There is approximately 1.3 stop light loss.)   *atlaslensco.com*


Focal Length	25mm	32mm	40mm	50mm	65mm	80mm	100mm
Aperture	T2-T16	T2-T16	T2-T16	T2-T16	T2-T16	T2-T16	T2-T16
Close Focus (ft)	1.5 ft	1.75 ft	2 ft	2.5 ft	2.75 ft	3 ft	3.5 ft
Close Focus (m)	.46 m	.53 m	.56 m	.76 m	.84 m	.91 m	1 m
Weight (lb)	6.2 lb	4.7 lb	5.2 lb	5 lb	5 lb	6 lb	6.7 lb
Weight (kg)	2.8 kg	2.1 kg	2.4 kg	2.3 kg	2.3 kg	2.7 kg	3 kg
Length (in)	7.4"	6.7"	7.4"	7"	7.2"	8.5"	10"
Length (cm)	18.7 cm	17 cm	18.9 cm	17.8 cm	18.4 cm	21.5 cm	25.4 cm
Front Diameter (mm)	136 mm	114 mm	114 mms	114 mm	114 mm	114 mm	114 mm
Image Circle (mm) Ø	31 mm	31 mm	31 mm	31 mm	31 mm	31 mm	31 mm

ARRI TRINITY 2 & ARTEMIS 2

TRINITY 2

ARTEMIS 2

SAM Plate

Vest
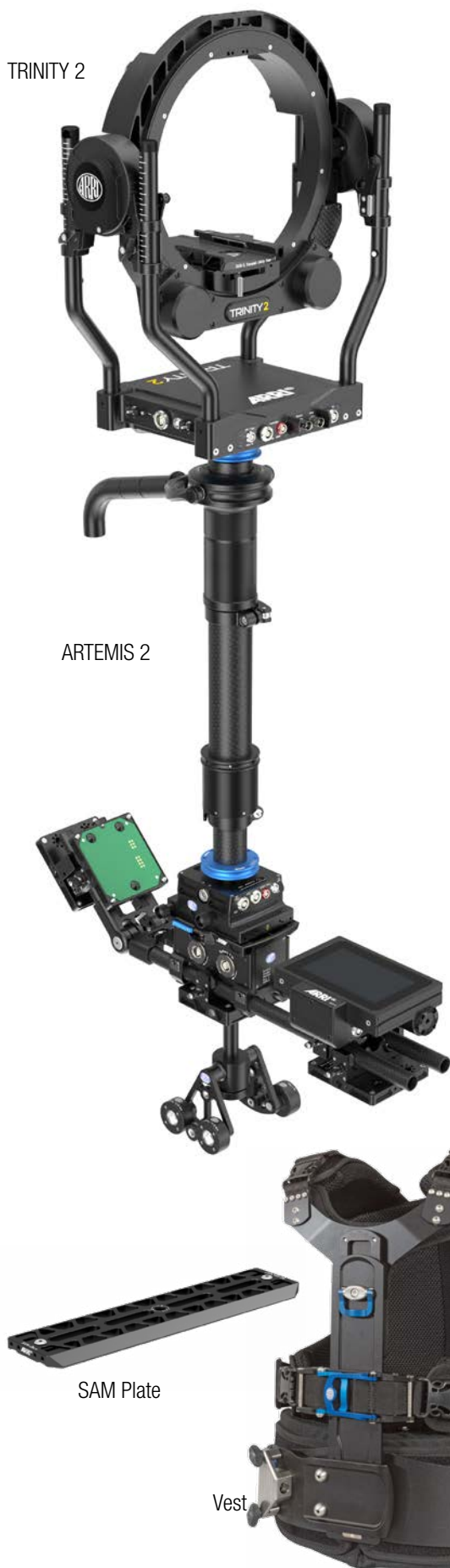
April 4, 2022. ARRI launches TRINITY 2 and ARTEMIS 2, their second generation of camera stabilizing rigs. ARTEMIS, now all caps at ARRI, once upon a time all lower case "artemis," was invented more than 20 years ago by cinematographer Curt Schaller, BVK, SOA. TRINITY arrived in 2016. To remember which is which, Artemis was the goddess of the hunt, an apt metaphor for capturing images, which is what the post, top plate and base do. Trinity, in lower case, means three, as in 3-axis movement and stabilizing, which is what the top part does. In other words, you can work with ARTEMIS 2 alone, without electronic stabilization and roll, or you can add the TRINITY 2 on top, and enjoy its advantages.

Curt Schaller explained: "Two years ago, we invited leading TRINITY camera operators to spend a weekend here in Munich. We said, 'OK, TRINITY 1 was a huge step. But, of course, TRINITY 1 was based on an older artemis design that dates back 20 years. Technically it was like using an old automobile chassis and putting in a powerful motor.

"So we said, 'Wait a minute, whatever we are going to do in the future, we have to renew the entire family from scratch.' That's what we did. We not only talked about what could improve on the artemis or TRINITY, we looked at improving the complete package. As you know, the main thing that people are looking for in our business is speed. That includes set-up time.

"For me, the number one thing was a package that was extremely fast to build on location, adjust, rebuild, reconfigure, change from one mode to another. The other thing we needed was more future-proof technology like 12-G video, LBUS and CAN Bus connections. You do not want to add more things to the camera itself, which makes it heavier. Instead, you want to mount external recorders, wireless transmitters and accessories to counterbalance the camera at the opposite of the post. So we added mounting points and connections at the bottom where they can work as a counterweight and still have a 12-G video. So, the new rig remains lightweight and agile and even gains speed in the way you can perform with it. It is a completely new design."

The new modular system has been redesigned with careful attention to details: enhancing camera movement, connections, power, user interface, balance options, and ruggedness. An easy upgrade transforms the purely mechanical ARTEMIS 2 into the hybrid TRINITY 2 for added electronic stabilization and 3rd-axis 360-degree camera rolls.

ARRI has developed a new camera mounting plate system called SAM. These baseplates let you quickly mount cameras from most major manufacturers to the stabilizers. The SAM standard allows quick, tool-free camera switching from either the ARTEMIS 2 or TRINITY 2 to a tripod or ARRI's stabilized remote heads.

The second-generation battery system consists of new, modular battery brackets. Because camera operators fly around the world, airline regulations usually keep you from bringing batteries. Now ARTEMIS 2 and TRINITY 2 let you use batteries from most manufacturers, anywhere in the world, for constant, regulated 12V DC and 24V DC power delivery. You can even mix and match up to three 12 V and 24 V batteries, using B-Mount, Gold Mount, or V-Mount.

In addition to the Standard Post, two new post lengths are available: the Super Post for longer reach and the Shorty Post for fast moves or cramped locations. The new bottom stage uses 19mm rods, available in carbon fiber, aluminum or steel, giving you additional counterweight opportunities when balancing the rig. The new monitor bracket accepts a wider range of monitors and is rod-mounted so it can slide back and forth for balance.

Curt concluded, "In the past year, we spent more than 400 hours just to develop a new graphic user interface to control TRINITY 2. It is based on muscle memory: once you do it, you will always recognize the maneuvers. It controls tilt and roll, as well as focus, iris and zoom if you like. I hope you like it!"

Stay tuned for deeper dives into TRINITY 2 and ARTEMIS 2 in the next issue of FDTimes.

arri.com/en/camera-systems/camera-stabilizer-systems

ARRI PCA for Sony VENICE 2

ARRI has modular, lightweight and rugged accessories for Sony VENICE 2, backwards compatible with VENICE 1, shipping now.

The four new ARRI Pro Camera Accessories (PCA) for VENICE are: a new Base Plate, Top Plate, and two Side Brackets. They are available individually or as four sets (Basic or Pro Cine Set and Basic or Pro Broadcast Set). They can be combined with each other and with existing ARRI PCA to equip a VENICE for any setup.

Philip Vischer, Product Manager of ARRI Pro Camera Accessories explained, "When we receive 3D CAD plans from the manufacturer, that's a good starting point to design the accessories. That is how we made accessories for the VENICE 1 when it came out. As you can imagine, we had no early idea of how the VENICE 2 would look like. It could have been exactly compatible, and then we would just have said, 'Okay, good, use the same accessories and that's it. But then, we realized that the bottom part of the VENICE 2 is different.

"On the VENICE 1 there is a kind of cutout where a removable shoulder pad attaches to the rear part of the base. The plate we had for VENICE 1 had a hump to fit this cutout space. Once we saw that the old base plate for VENICE 1 was not compatible anymore, we realized that at least we have to do a new, completely flat base plate. If customers only bought the new plate at the bottom, they could still use all their older accessories.

But then, we got the feedback from users of VENICE that they wanted to have side brackets as well. It was at that point that we decided to make a completely new set of accessories for VENICE 2, which are also backwards compatible to VENICE 1. And these are our new VENICE 2 PCA accessories."

arri.link/3GLWIbV

New, completely flat Base Plate for VENICE 1 and 2

New Top Plate for VENICE 1 and 2

James Guest on Sachtler aktiv Fluid Heads

aktiv design and engineering evolution

James Guest is the mechanical engineering manager at Vitec Production Solutions in Bury St. Edmunds, UK. That includes Sachtler and OConnor tripods. He joined Vitec in 2006. Prior to that, he worked at Bentley Motor Cars in Cheshire, England. The flowtech carbon fiber tripod with the 75mm bowl was launched in 2017. The 100mm bowl flowtech followed a year later. Sachtler introduced 100mm bowl aktiv 10, 12 and 14 heads in January 2022 .

Jon Fauer: Can you adjust the flowtech 100's carrying handle?

James Guest: Yes it is designed to spin around. Because, with aktiv and flowtech working together, you can drop the tripod right onto the floor so it sits flat and low. It wasn't something that was in the original specification for the design. We have a customer who lives nearby. He came in and was trying out a very early prototype and put it down on the floor, and said, It'd be interesting if you could do this." We did. It was a feature we hadn't started with.

What materials are used in manufacturing the aktiv?

The aktiv housing is made of die-cast aluminum. The lever in front that you pull up to level the head is made from a composite plastic. We spent a long time optimizing the shape. In fact, we've made a huge range of prototypes and concepts in the factory, showing a bit of the evolution and the shape of the lever. It's designed so you can get a finger in there with a glove to start the lever off. We use plastic where you have contact with the head because it's not quite as cold as metal can get. *(See photo above.)*

Hemingway said a martini should be cold enough that your fingers stick to the glass. But fingers sticking to an ice-cold metal fluid head is not pleasant.

The release handle is carefully designed so you can work with it while wearing gloves.

Can you replace the points at the bottom of the legs?

Yes. On flowtech, there was a significant improvement from what we did before. Most tripod points are glued together and not as easy to service. So, there's one screw to undo from the back and then you can just take the foot out and replace it.

From an engineering point of view, would an aktiv 14 manage a lighter payload as smoothly and as well as an aktiv 10?

Yes, exactly. It's purely down to the total mass of the payload. If you don't need the larger capacity and the larger plate, then the 10 is an excellent choice. It has a smaller platform, smaller touch-and-go plate and smaller side plates. So the overall head is a bit lighter, a bit more compact.

Do you think there might be a 150mm bowl aktiv eventually?

It's a good question. Obviously the payload would be a lot higher, and the requirement for the clamping becomes more challenging. It's doable. It's just a question whether users with heavier cameras would ask for the super speedy setup of the aktiv.

I found aktiv and flowtech 100 significantly speedier to level.

It's a funny thing. It's one of those muscle memory things. When you first get an aktiv head, you're still trying to loosen the ball leveling from underneath. But once you've become familiar with the new way of leveling, I don't think you really want to go back. During the development, speed was one of the targets we had. We timed the length of time to do four levels: north, south, east and west. It was a way of showing that we could actually test whether it improved the speed. It was a bit of a race, who could do it quicker. I think we were in the region of around 50% quicker leveling aktiv than traditional methods.

Sachtler aktiv

1. The underside of a flowtech 100 tripod's 100mm bowl.

2. Instead of a threaded tie-down knob, flowtech has a bowl connector.

3. The bowl connector attaches through the bottom and stays there.

4. Top view of bowl and connector. Three red handles loosen each leg.

6. The bottom of the aktiv head attaches to the bowl connector

7. Side view. The carrying handle flips up when you go flat on floor.

14 ZEISS Supreme Primes

April 5, 2022. ZEISS adds a 15 mm T1.8 lens their series of Full Frame ZEISS Supreme Prime lenses. ZEISS Supreme Primes were introduced in June 2018. In the beginning there were 5 focal lengths and the initial roadmap showed 13. New focal lengths were added like clockwork. Now the set consist of 14 ZEISS Supreme Primes.

About the new 15 mm Supreme Prime, Christophe Casenave, Head of Cinema Lenses at Carl Zeiss AG, said, "Having the Supreme Prime 15 mm is a game changer. It creates a new perspective in Large Format / Full Frame.

"The SP 15 is, in fact, a rectilinear super wide angle lens, equivalent in field of view to a 10 mm on Super35. This makes the ZEISS Supreme Prime set complete for use on Super35 cameras as well because 15 mm is the 'standard wide angle' lens in the S35 format.

"It is also important to point out that we've been able to create a 15 mm T1.8 within a fairly compact lens housing and with this level of quality. Equivalent lenses generally have a larger compendium (the front diameter of the lens where you attach the mattebox."

ZEISS Supreme Primes come in PL or LPL lens mounts that can be swapped by the user, rental house, DP or camera assistant. The lenses come with Cooke /i and ZEISS eXtended Data.

Christophe described the look of Supreme Primes: "They have a gentle sharpness. We insisted on a look that is versatile and flexible. These are not a vintage lenses. They do not have a specialized look. We do not dictate a look to cinematographers. We make lenses to the best of our ability so that all possibilities are available. They allow you to have sharpness where you need it, but also with very smooth skin tones and textures.

"We worked hard on the Supreme Primes to achieve the sharpness of Master Primes, but also to have a more smooth fall-off. We made the transitions between the areas in-focus and out-of-focus, between the sharp and the un-sharp parts, much smoother. The focus fall-off is much gentler. When you consider that DPs confront actors' and actresses' faces 80 percent of the time, this helps a lot—eyelashes are sharp and the face is silky smooth."

Lens	Aperture	Close focus	Front Diameter	Length	Weight	Image Diagonal	Focus Barrel Rotation
15 mm	T1.8 to T22	0.35 m / 14"	114 mm	149 mm / 5.9"	2.25 kg / 4.96 lb	46.3 mm	300°
18 mm	T1.5 to T22	0.35 m / 14"	114 mm	163 mm | 6.4"	2.27 kg / 5.00 lb	46.3 mm	300°
21 mm	T1.5 to T22	0.35 m / 14"	95 mm	120 mm / 4.7"	1.61 kg / 3.54 lb	46.3 mm	300°
25 mm	T1.5 to T22	0.26 m / 10"	95 mm	119 mm / 4.7"	1.42 kg / 3.13 lb	46.3 mm	300°
29 mm	T1.5 to T22	0.33 m / 13"	95 mm	121 mm / 4.8"	1.61 kg / 3.55 lb	46.3 mm	300°
35 mm	T1.5 to T22	0.32 m / 13"	95 mm	119 mm / 4.7"	1.40 kg / 3.09 lb	46.3 mm	300°
40 mm	T1.5 to T22	0.42 m / 17"	95 mm	121 mm / 4.8"	1.49 kg / 3.28 lb	46.3 mm	300°
50 mm	T1.5 to T22	0.45 m / 18"	95 mm	119 mm / 4.7"	1.22 kg / 2.69 lb	46.3 mm	300°
65 mm	T1.5 to T22	0.6 m / 2'	95 mm	121 mm / 4.8"	1.63 kg / 3.59 lb	46.3 mm	300°
85 mm	T1.5 to T22	0.84 m / 2'9"	95 mm	119 mm / 4.7"	1.42 kg / 3.13 lb	46.3 mm	300°
100 mm	T1.5 to T22	1.1 m / 3'9"	95 mm	119 mm / 4.7"	1.70 kg / 3.74 lb	46.3 mm	300°
135 mm	T1.5 to T22	1.4 m / 4'6"	114 mm	146 mm / 5.7"	2.27 kg / 5.00 lb	46.3 mm	300°
150 mm	T1.8 to T22	1.5 m / 5'	114 mm	146 mm / 5.7"	2.27 kg / 5.00 lb	46.3 mm	300°
200 mm	T2.2 to T22	2 m / 6'6"	114 mm	183 mm | 7.2'	2.87 kg / 6.33 lb	46.3 mm	300°

New Supreme Prime 15 mm T1.8

Actual Size
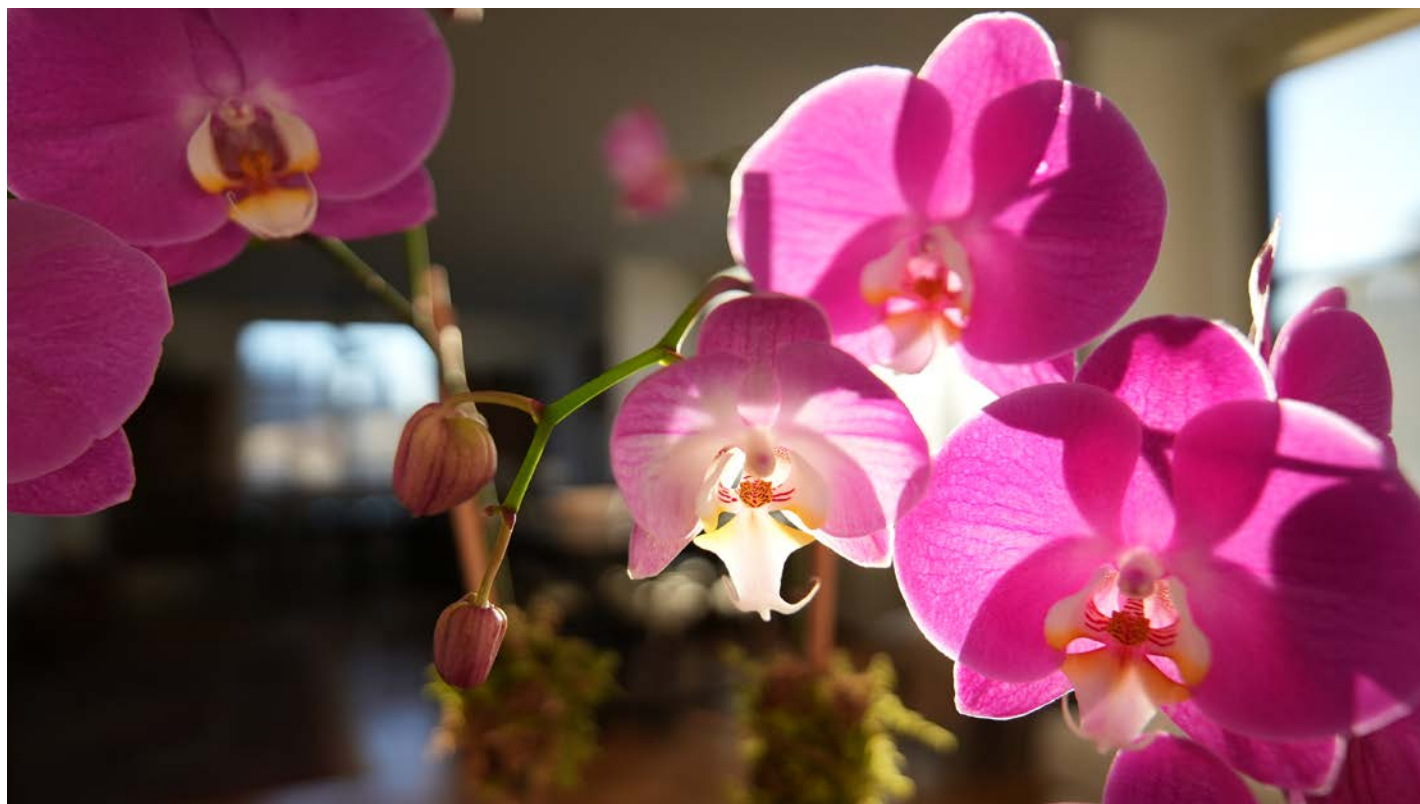
Supreme Prime 15 mm T1.8

The Supreme Prime 15 mm focuses very close, up to 14 inches from the image plane. It covers the entire FF/VV sensor of a V-Raptor (46.3 mm), ALEXA Mini LF (44.71 mm) or VENICE (43.5 mm).

The Supreme Prime 15's field of view in Full Frame is equivalent to a 10 mm focal length in Super35. (Divide by 1.5.)

But a 15mm lens is a 15mm lens no matter whether you're shooting in Full Frame or Super35. So, let's mount a Supreme Prime 15mm on a Super35 camera like an URSA 12K, or ALEXA Mini, RED V-RAPTOR, or VENICE in Super35 Sensor Mode.

It is still a 15mm focal length, but the field of view in Super35 is now equivalent of a 22.5mm focal length lens in Full Frame format (multiply by 1.5). The lens "sees" or covers the same area, but the Super35 camera has a smaller sensor that "crops" the image. Above: Full Frame. Below: Super35.

Supreme Prime 15 mm Full Frame & Super35

RED V-RAPTOR
Full Frame / VV and Super35

ZEISS SP15 at 14" close focus
on V-RAPTOR

1. The red frame shows the SP15 image on a Full Frame / VV camera, seen here on a monitor. The smaller, radiant blue frame shows how a Super35 camera's smaller sensor "crops" the SP15 image. The image area outside the blue frame is, you could say, "wasted."

2. This is how the Super35 image looks on a monitor. Because it's cropped, and therefore tighter, it appears as a 22 mm in Full Frame.

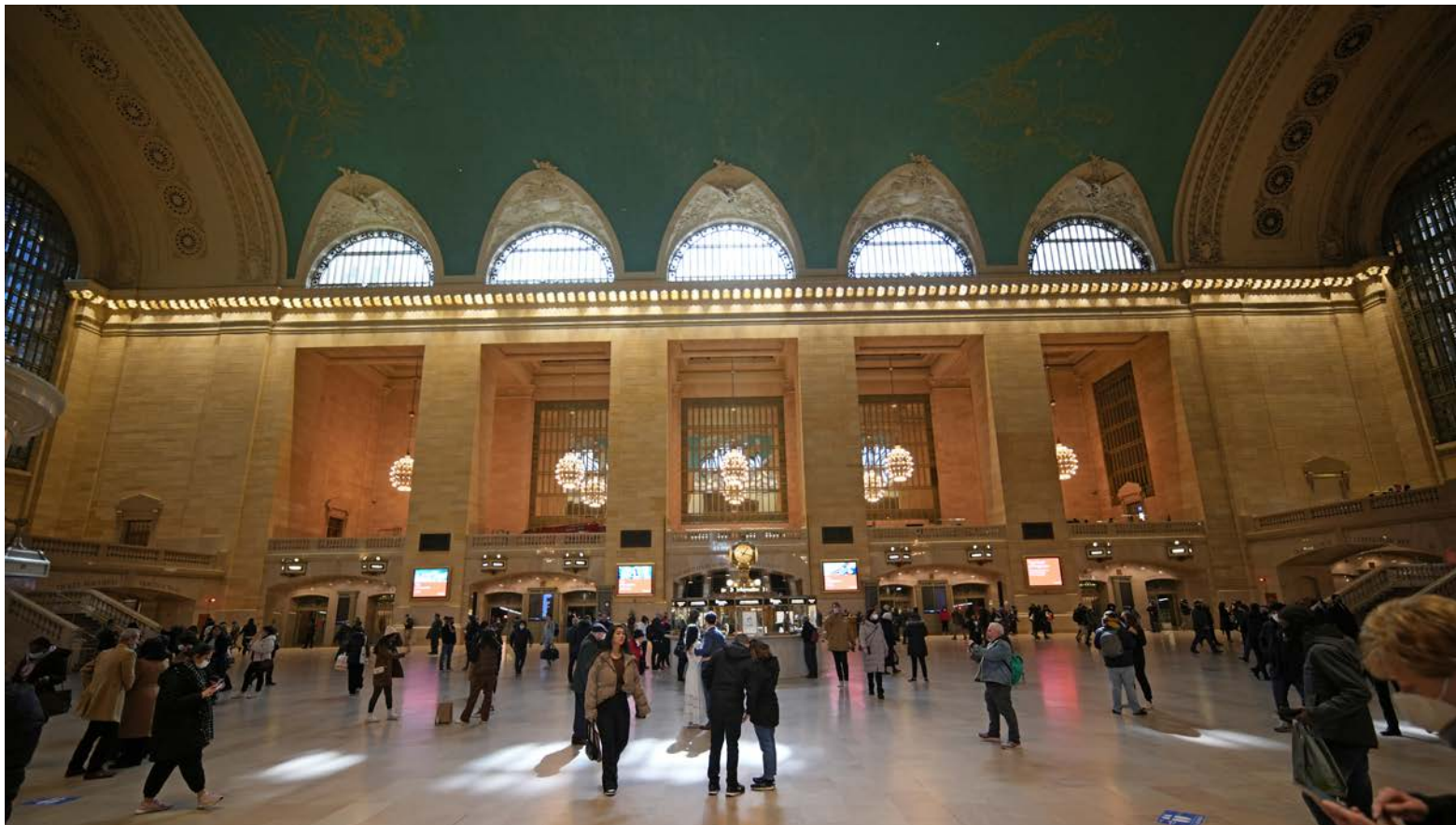
Blackmagic URSA Mini Pro 12K
Super35

ZEISS Supreme Prime 15

ZEISS Supreme Prime 15

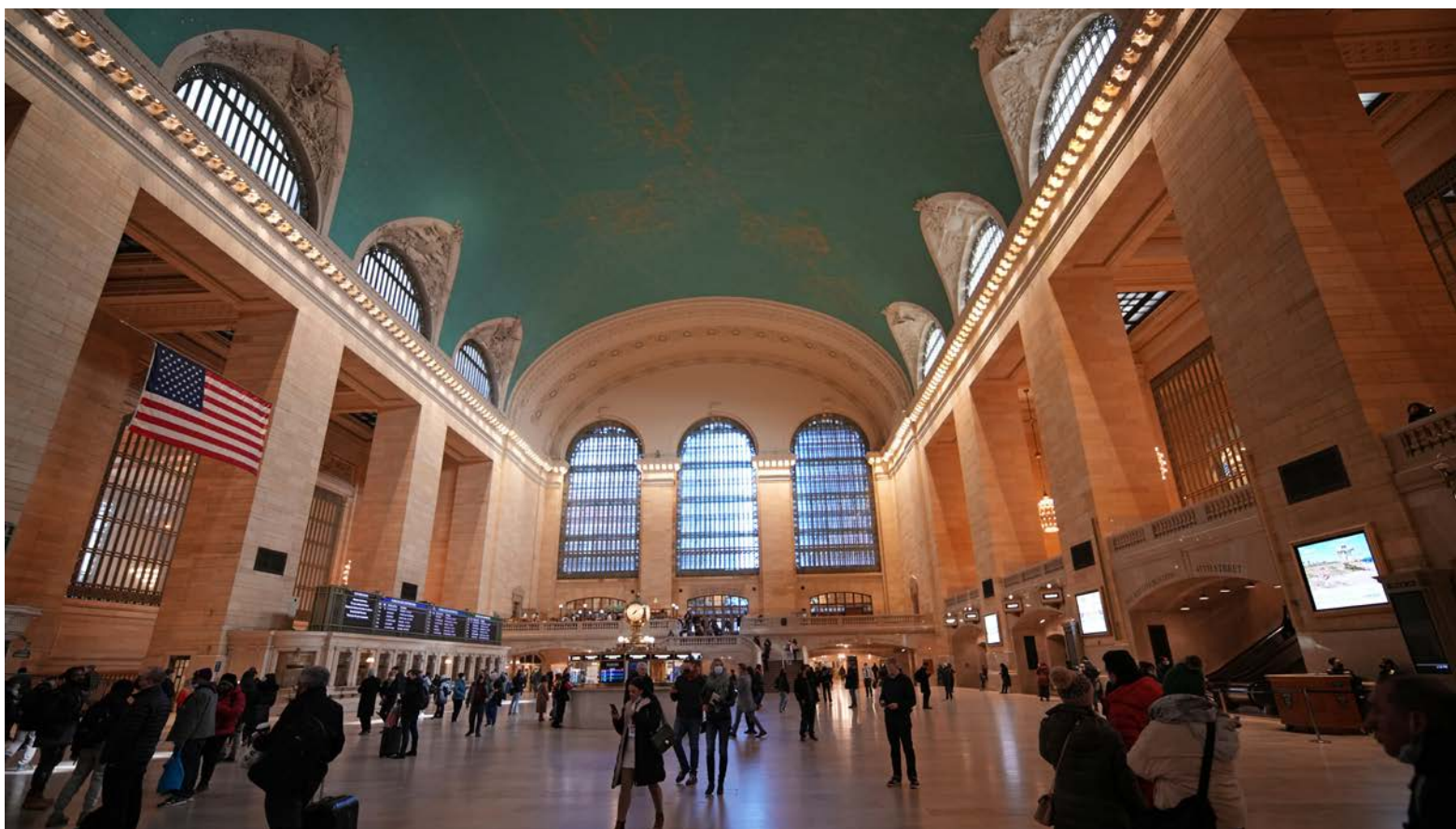# Supreme Prime 15 Rectilinear in Grand Central

The ZEISS Supreme Prime 15mm is faster, lighter, narrower and shorter than many wide lenses. And so, what better place to try it than the 35,000-square-foot Main Concourse of Grand Central? It is rectilinear, meaning that straight lines stay straight, not curvilinear. Walls, buildings and architectural details do not curve inward. Geometric, barrel or pincushion distortion is minimized.

Supreme Prime 15 Rectilinear in Grand Central


Above: View with Supreme Prime 15 from a balcony about 20 feet above the floor. Lines are parallel and the perspectives appear normal. Below: But, go down to ground level and tilt up. The rectilinear, off-level forced perspective stretches the distant walls inward and makes people in the foreground look bigger. The elliptical barrel-vaulted ceiling is 160.25 feet high at the center.

Supreme Prime 15 Rectilinear in Grand Central Terminal
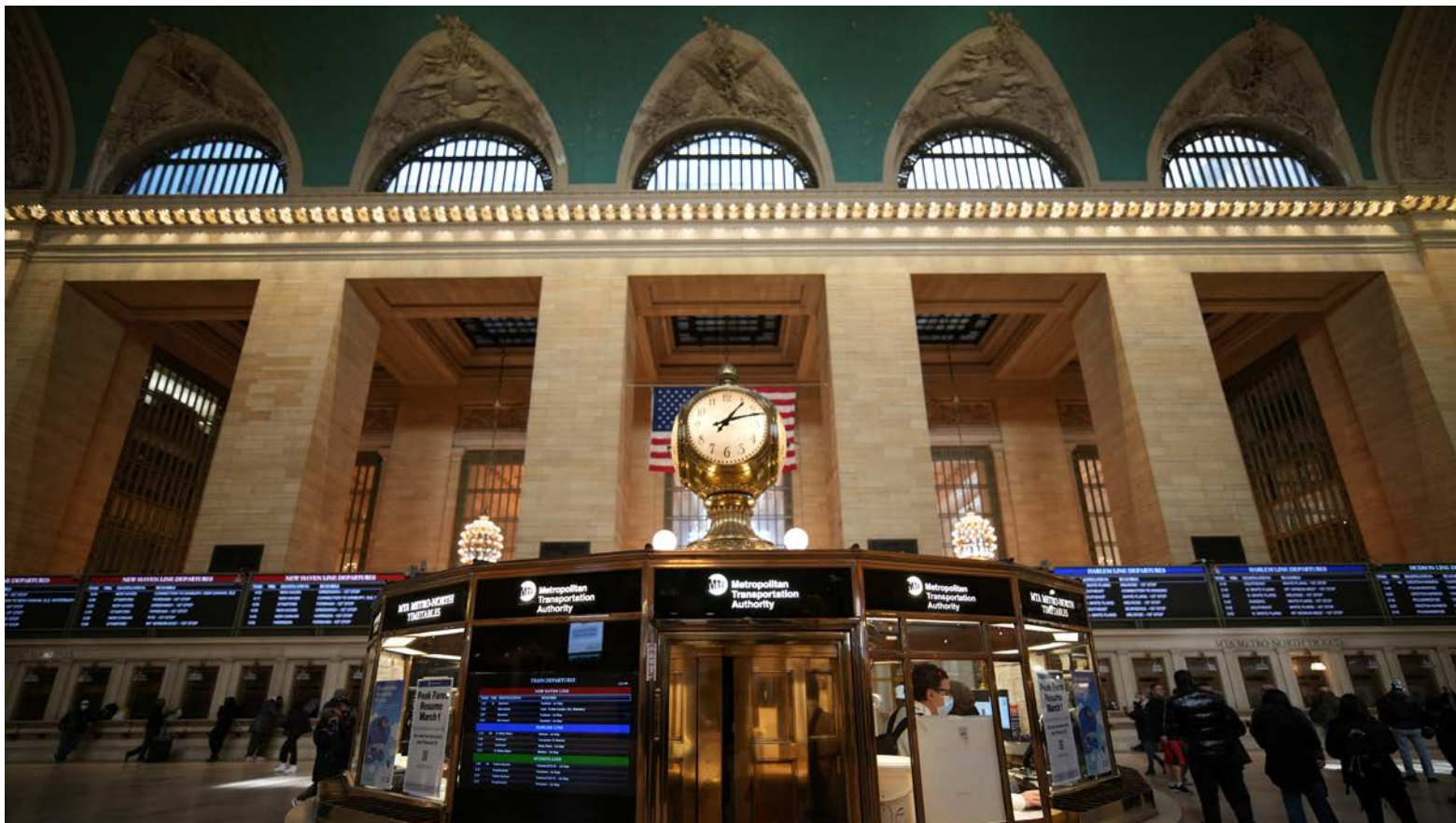


The four-faced clock above Grand Central Terminal's information booth is the place to go when a New Yorker says, "Meet me under the clock." Better yet, meet at the Oyster Bar on the lower level. You can choose from 25 varieties of fish and 30 types of oysters. William Grimes, food critic of the New York Times, wrote in 2003: "Lunch at the Oyster Bar is a sure-fire recipe for human happiness."
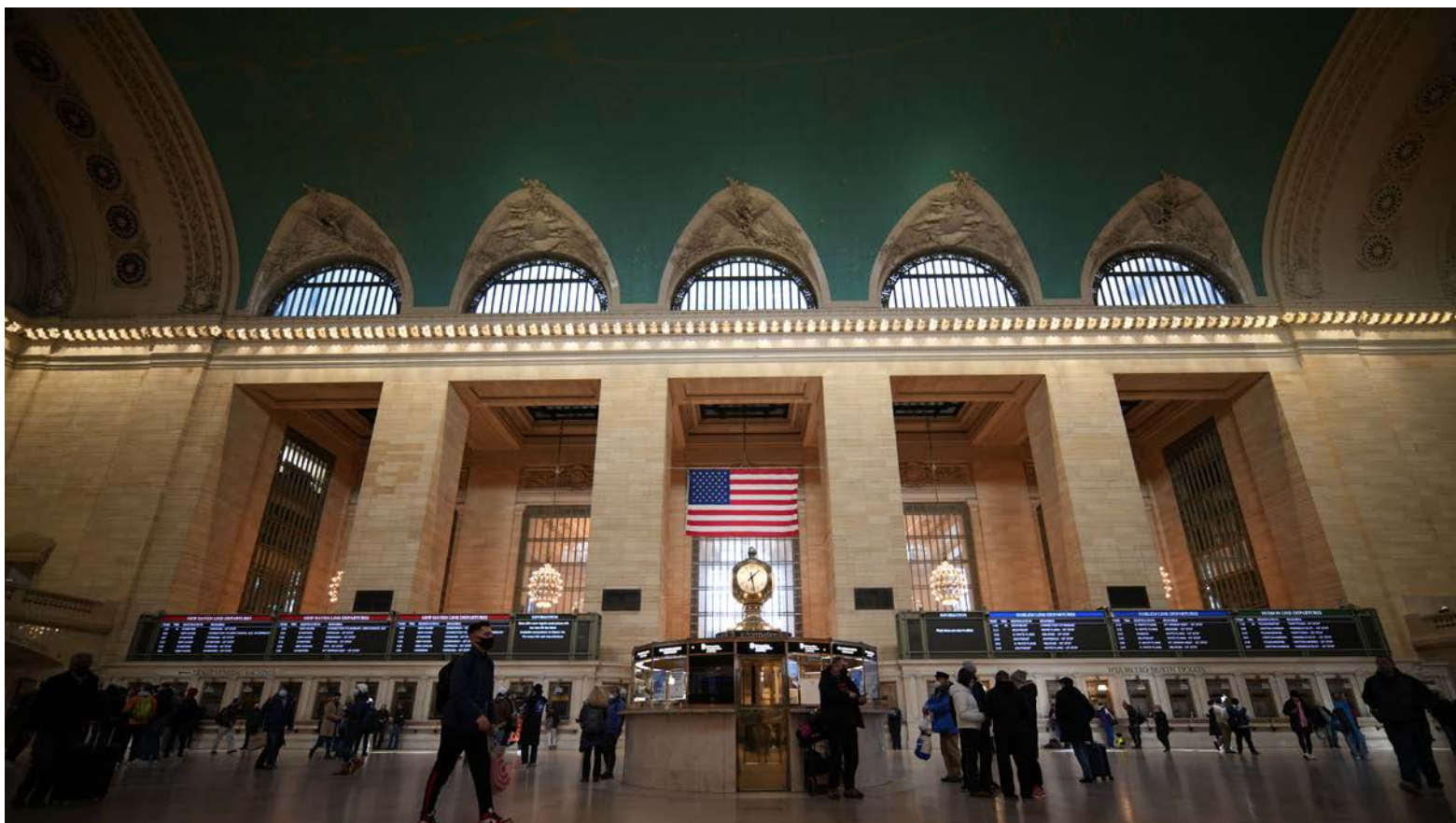
Supreme Prime 15 Rectilinear in front of Grand Central

For a few dollars more at a restaurant with rectilinear views skyward, take the Vanderbilt Avenue exit of Grand Central Station to Chef Daniel Boulud's Le Pavillon on the second floor of the 93-story skyscraper across the street. Ryan Sutton writes in *Eater*: "Windows reveal Grand Central Terminal in all its Beaux-Arts glory. The commuter station seems to glow like the Temple of Dendur."
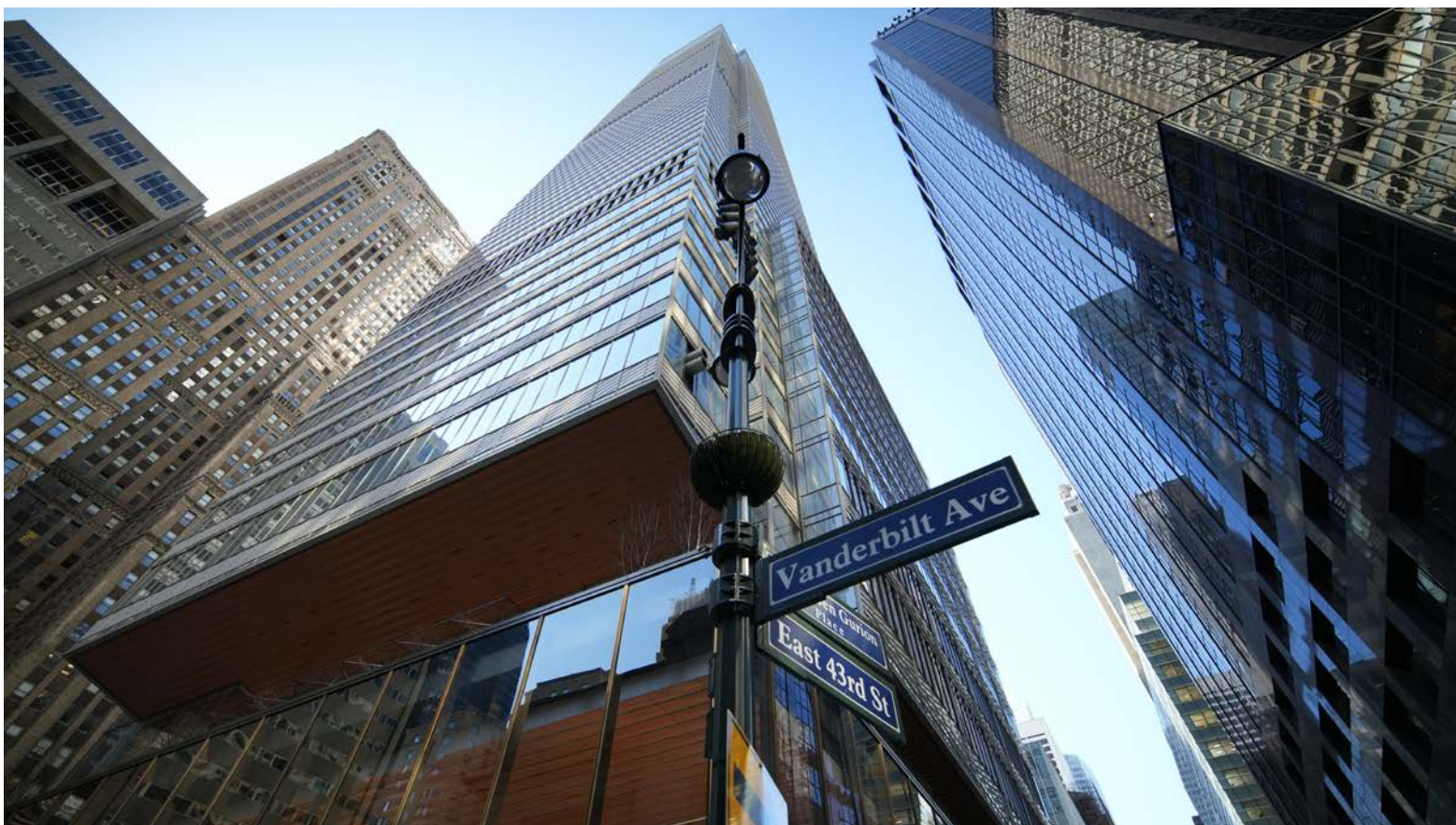
SIGMA 20mm F2 DG DN Contemporary I series Prime
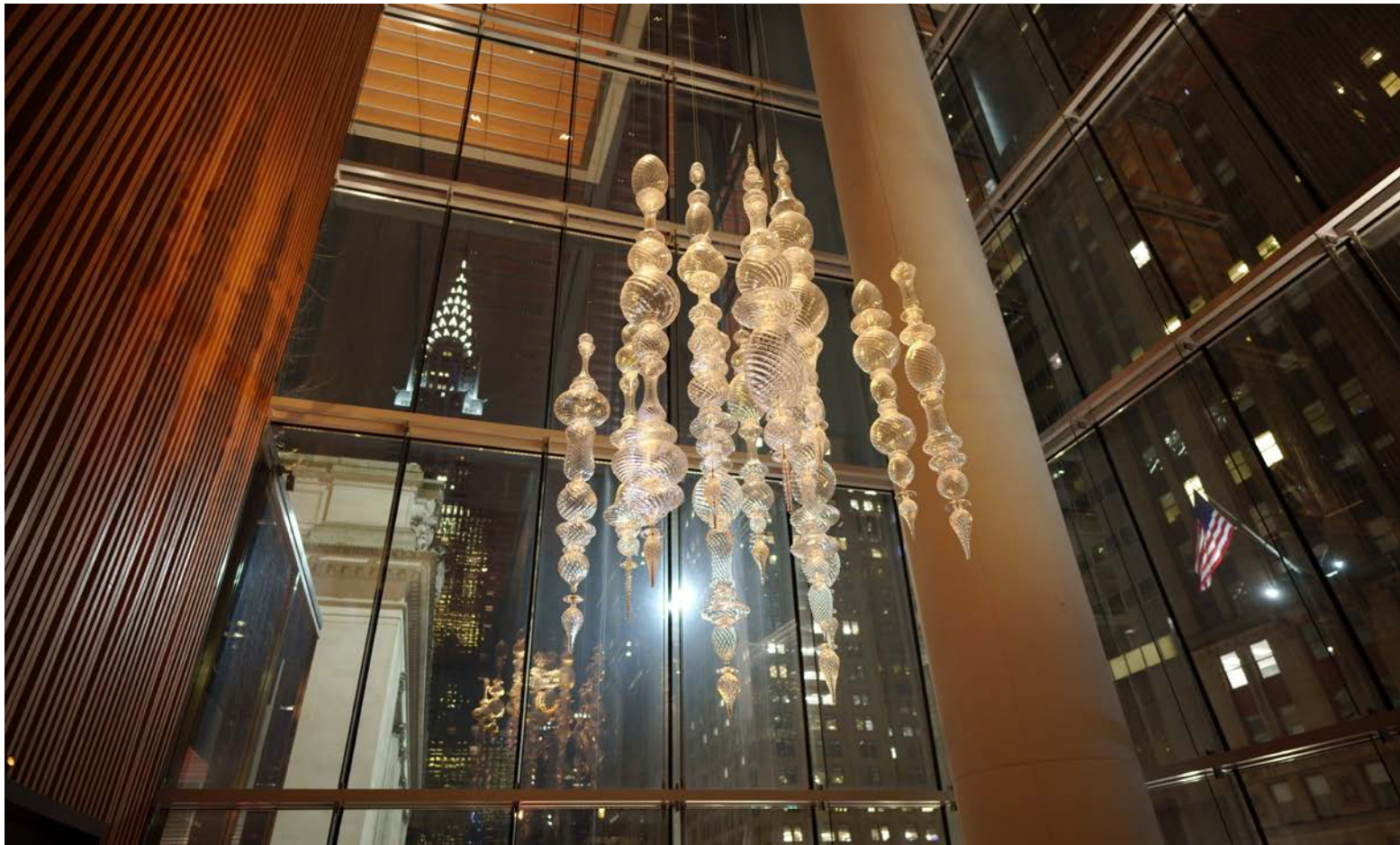
Here is the "glow like the Temple of Dendur" that is Grand Central Station. What better place is there for Film and Delicious Times to revel in the retrofocus angles of SIGMA's new 20mm F2 DG DN Contemporary I series lens than the soaring space of Le Pavillon restaurant at 1 Vanderbilt Avenue.

"Eats, shoots & leaves," the book, came to mind. SIGMA's 61 Megapixel fp L (as in food photography Loving) camera and its companion 20mm F2 DG DN lens arrived discreetly in a jacket pocket and then easily hid behind a starter dish of Thon Fenouil composed of yellowfin tuna, fennel pollen, and socca crisp in a tonnato sauce. As usual, the FDT gaffer and grip team diffused iPhone illumination with tissues and bounced with napkins while a plate of Homard Topinambour was covered from enough cam-

era positions to warm the heart of the most demanding agency art director. The butter poached Maine lobster with tarragon and sauce américaine, sunchoke and salsify, as stealthily captured in extreme close-ups, discreetly done.

The best seats at Le Pavillon are at the bar, with its Sword of Damocles icicle chandelier above, flanked by massive columns with never a bend through the lens of the unwavering 20mm SIGMA I-series. Towering windows offer epic views of Grand Central and the Chrysler Building with its *Bonfire of the Vanities* title sequence gargoyles. Inexplicably and unsettlingly, a low hanging ceiling dangles over the main dining area, perhaps to present a more intimate experience or maybe to muffle the din of energetic commuters enjoying the evening before boarding trains heading home to the suburbs on Metro North.

Oh, yes, this is supposed to be an article about the wondrous SIGMA 20mm F2 DG DN | Contemporary, the 7th and widest lens in the all-metal I-series of L-Mount and E-mount compact primes.

SIGMA's lens team describes the design: 13 elements in 11 groups, with 1 FLD, 1 SLD and 3 high-precision glass-molded aspherical lens elements that make possible its high MTF, compact size, and absence of aberrations. Minimum focus is a mouth-watering 8.7" / 22cm. Weight: 13.1 oz / 370g. Dimensions: 72.4mm x 70mm / 2.9" x 2.8" (length x front diameter). Auto and manual focus. Auto and manual aperture, calibrated in linear ⅓ stop increments.

The SIGMA 20mm F2 DG DN is a rectilinear delight for capturing moving pictures and stills of architecture, landscapes, portraits, astrophotography and rooms with a view.
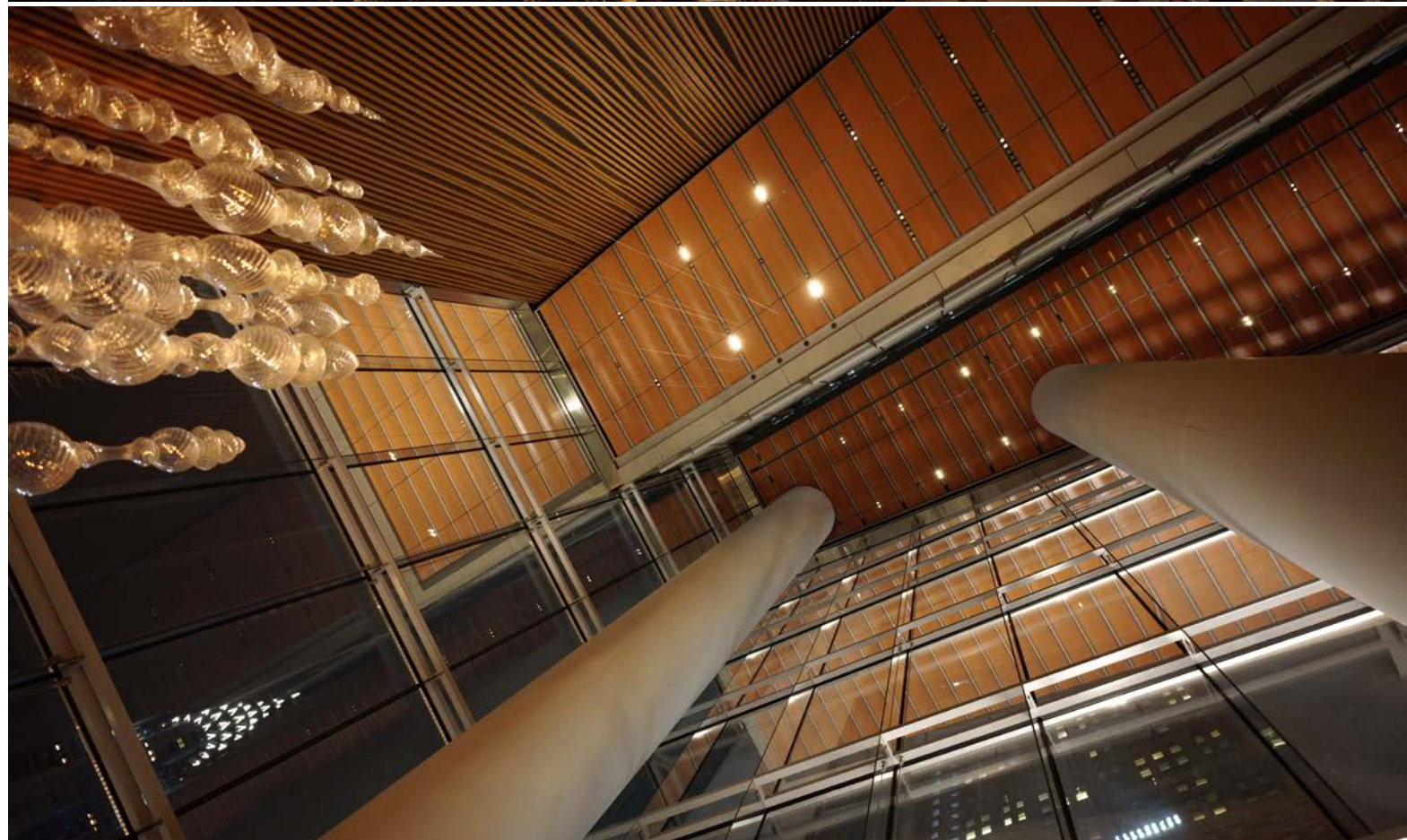
Leitz HENRI DP/Director's Finder

Reintroducing HENRI.

We first met prototypical HENRI in December 2020, named after the Swiss grandnephew of Ernst Leitz I.

Dr. Henri Dumur was a Managing Director of Ernst Leitz Optische Werke Wetzlar. He joined the company in 1903 at the age of 18. He spent 60 years working, supporting the company and the Leitz family.

The LEITZ HENRI DP/Director's Finder is here now, ready to support cinematographers and directors in the quest for great angles while location scouting and during daily production.

Paired with the SIGMA fp L camera, you have a 3.68 Million dot EVF, unlimited aspect ratios, and up to 5 sets of standard or user-definable framelines.

Paired with the Leica SL2-S, you have a 5.76 Million dot EVF and can choose one of five common framelines.

Paired with Leitz Elsie primes...chart below.

Leitz ELSIE 75mm T2.1 prime lens in LPL Mount

SIGMA fp L camera with EVF-11, SSD for 12-bit uncompressed CinemaDNG

Leitz HENRI with L to LPL Mount, birchbark handgrip, Carbon fiber 15mm LW support, Start / Stop / Shutter control, Lens support, optional LPL to PL Adapter.

SIGMA fp L screenshot showing framelines for 1.33:1, 1.85:1, 2.39:1, 2:1 and 2.76:1 aspect ratios.

Leitz Elsie Prime Lenses

Focal Length	15mm	18mm	21mm	25mm	29mm	35mm	40mm	50mm	65mm	75mm	100mm	125mm	150mm
Aperture	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	
Close Focus (ft)	1'2"	1'2"	1'2"	1'2"	1'2"	1'2"	1'2"	1'8"	2'2"	2'6"	2'10"	4'2"	5'
Close Focus (m)		0.35	0.35	0.35	0.35	0.35	0.35	0.5	0.65	0.75	0.85	1.25	1.5
Front Diameter (mm)		114	114	95	95	95	95	95	95	95	95	114	
Length (in / mm)		6.3" / 160 mm											
Image Circle / Lens Mount		46.5 mm / LPL Mount (44 mm flange focal depth) with /i Technology and LDS-2 lens data											

Leitz HENRI + SIGMA fp L + Screenshot

CINE Mode

When using the SIGMA fp L as a Finder in CINE mode, press the Red REC button to capture the scene in video. Or press the shutter button to capture a still.

To capture stills with the shutter button, be sure to set the menu as follows:

SHOOT > Shutter Button Settings (CINE) > Shutter Button Functions (CINE) > Shutter.

Still Mode

Of course, in STILL mode, the shutter button takes the still photo.

SCREENSHOT

To capture a still image with framelines, use the SCREENSHOT function. You can also include camera settings if you like. If you're using an L-Mount lens, the focal length and focus distance will also be included in the Screenshot (see example at bottom right).

To capture a SCREENSHOT, first press the DISPLAY Button and then the TONE, COLOR, MODE or OK Button.

The latest fp L firmware lets you assign SCREENSHOT to a button, for example, the left "button" of the 4-way rear dial:

SHOOT > Custom Buttons Functions > Left Arrow "Button" > Screenshot.

LCD / EVF slide switch

SCREENGRAB: 1. First press the DISPLAY button.

2. Then press the TONE, COLOR, MODE or OK button.

Or assign Screengrab to a button.

Screengrab with in-shot display data turned to MINIMAL. Single frameline adjusted to thin width and no crosshair.
Because this was shot with a PL to L-Mount adapter, the lens metadata is not displayed. Remaining data is out of frame: fps, shutter, F-stop, ISO, color temperature, etc.

Screengrab with multiple framelines, record settings and lens data displayed. This setup is helpful for scouting. You can return at a later date and match focal length. Note: focal length and focus distance only show up if you're using an L-Mount Alliance lens.

And then you can slide the top switch of the camera from CINE to STILL and shoot a 61 MP (9520 x 6328) photo, which prints 31" wide x 21" high at 300 dpi.

Kazuto Yamaki, CEO of SIGMA Corporation, on Supply Chain

Jon Fauer: What is your impression of the supply chain situation in Japan right now?

Kazuto Yamaki: Not only in Japan, it's a worldwide problem. The most difficult materials to obtain are semiconductors. Many industries rushed to secure the semiconductors they needed. I heard that automobile companies are stockpiling semiconductors for their production. The majority of the production capacity of the semiconductor manufacturers have been taken by the automobile companies. That's why, for example, at SIGMA, we already placed orders many months before, but still, they suddenly tell us, "We can't supply this part next month." It's hard to make forecasts.

Why do you think there's a shortage of semiconductors? They're not making more cars than they were before?

My understanding is that the car companies need more semiconductors because the latest cars use more and more electronics. Many cars have more cameras and more electronically controlled features. This demand will increase. The second reason is that among the car companies, most, not only Japanese companies, but almost all car manufacturers use a so-called Toyota production system, which is a just-in-time system.

So, they reduced the amount of stock on hand as much as possible. This system was heavily affected by the confusion of the COVID-19 pandemic since the beginning of 2020. For example, at that time, Toyota had to reduce their production by 40% from the normal operation, which is a big impact on the manufacturer. Now, Toyota and other manufacturers are revising their strategy and ask their suppliers to stock more parts in advance. Before COVID, according to the news, suppliers might have had only a maximum of one month stock level, but now, they are asked to have a three month or four-month stock level. This sudden demand is stretching the capacity of the semiconductor companies. There is also another reason: accidents and natural disasters. There were fires at several semiconductor factories in Germany and Japan, droughts in Taiwan, severe winter weather in Texas. These all have hindered semiconductor production.

How does that relate to the photography and cinema industry?

We all use semiconductors, even if they might be different varieties. But car companies have a bigger business, so they have a stronger bargaining power. Also, the gaming industry is booming and they have greater influence on semiconductor manufacturers. That can have a negative impact on smaller businesses like cameras or cinema.

Companies like Toyota reverting from just-in-time production to actually stocking more parts as they did in previous years?

Actually, semiconductor manufacturers have been busy, even before COVID-19. At SIGMA, we also work with several semiconductor manufacturers. Up until maybe three or four years ago, most advanced semiconductor factories were busy, but the relatively old semiconductor factories were not so busy. They were struggling to keep running. For some reasons, three or four years ago, all the semiconductor factories became very busy, because many devices, not only cars or cameras, but also home appliances and games and other items started using these very basic semiconductors. Those semiconductors don't have to be manufactured at the most advanced factories. That's why the entire semiconductor industry has been busy, even before COVID-19.

How about SIGMA? Has your factory in Aizu been affected?

Yes. Right now, several staff have had to stay at home because they had COVID-19 or their family members were infected, or the schools shut down because of too many cases. But we were prepared for this and production was able to continue. Like other Japanese companies, many of our employees at the Aizu factory are trained to be multi-skilled— even if some vacancies occur, it does not have a significant impact our production system.

Are you getting the parts that you need?

Except for semiconductors, the rest of our parts suppliers such as mechanical parts are 99% in Japan, so we are okay. Some other major manufacturers and brands have their main factories in Thailand, Vietnam, Malaysia, or other Southeast Asian countries that had a very strict lockdowns, especially in 2020 and 2021. During that time, they were really separated from their supply chains. So compared to them, we are in a little bit of a better situation. But we have a similar problem with materials because it's a global semiconductor issue, and some raw materials like copper, aluminum, silicon, and brass are hard to obtain.

How about glass for the lenses?

Glass suppliers are also running their factories at 100% capacity. They're also very busy, but we have not had any supply issues so far.

Can the supply chain for semiconductors get better?

Almost every week, we are surprised by the news from our suppliers. It never happened before, because we have really long relationships with our business partners who supply our semiconductor for maybe 20 or 30 years. But these days, they suddenly tell us, "Sorry, we can't supply parts" two weeks in advance or something like that. It's always sudden. According to the information from them, this situation will continue at least six months, for the first half of 2022.

What has to change for supply to increase?

Oh yes. I heard that many factories are expanding their capacity by building new factories. This is an interesting story. Many semiconductor manufacturers are trying to expand their capacity by installing the new machines, but again, because of the low availability of semiconductors, the companies can't supply the machines that actually manufacture the chips. That's why it's slow to expand the capacity.

How do you think that will affect your business? Do you have to raise prices on products?

Customers are suffering from inflation; the living cost is increasing. So, as a company and as the SIGMA brand, we don't want to raise the prices easily. The price increase of oil, food or basic necessities directly have an impact on daily life. I understand that those companies need to increase prices and that will have a significant impact. Compared to that, cameras and lenses are much more expensive products. We have less impact from the price increases of the basic materials.

But having said that, we are now getting many price increases of materials, parts and delivery costs. Delivery costs are three to four times higher than before. I'm personally reluctant to increase the prices immediately, but several months later, we may need to consider it and raise prices in the future.

Steadicam M-2 Core Kit

Steadicam M-2 Core Kit Components

M-2 Flat Top Stage

Steadicam Padded Docking Bracket

1.58" 2-Section Post

M-2 Gimbal

Steadicam Sled

Steadicam G-50X Arm

Monitor Bracket

Gold Mount Battery Base

Steadicam Zephyr Vest

The latest complete, high-end Steadicam system is the M-2.

But what if you already have a vest or post, for example. Tiffen has introduced the new Steadicam M-2 Core Kits. Now you can buy individual ingredients of the formidable Steadicam M-2 system, just as you might order take-out from a famous restaurant of just the main course because you already have the appetizer prepared.

Steadicam M-2 Core Kits offer a more affordable option with various configurations and prices. For sure, you could buy the entire Core Kit and it would be the same price with the same parts as a complete M-2.

Or, as they say at Tiffen, "Start your Steadicam journey." The M-2 Core Kit's individual components provide affordable entry into the Steadicam M-Series system. All M-Series components and accessories, including the Steadicam M-2 Volt, are fully compatible and interchangeable. As your needs and jobs change, the M-2 system can evolve with you.

Both versions include:
- Flat Top Stage (M2-TSF) with Dovetail, bubble level, 3 LEMO power connectors, 2 D-Taps, LEMO for camera power, ready for an optional Volt.
- Gimbal (M2-GIM) fits ¾", ⅝", ½" arm posts. Volt ready.
- 2-section Carbon Fiber Post (158-2SP) adjusts 21.7-38.9" / (551-989 mm).
- Monitor Bracket (158MB-UMM) for 5 - 10" monitors, attaches to post and has standard 15mm LWS rods.
- Battery Base (M2-GMBASE or M2_VMBASE).
- G-50X (G50XARM), 50 lb payload, ¾" and ⅝" arm posts.
- Zephyr Vest (807-7800-02), adjustable - one size fits all.
- Padded Docking Bracket (817-7980), Volt ready.

Steadicam Volt Motor Drive Unit

Steadicam Volt is an accessory and fully compatible with M-2 Core Kits. They call it optional but you should make it essential for level horizons.

The Steadicam M-2 Volt is an easily-added, optional accessory for M-2 Core Kits. "Optional" is not an option. You want it. M-2 Volt complements, rather than opposes, normal operating by holding a level horizon. Volt also actively assists in maintaining almost any tilt or roll angle. It consists of a control box and motor drive unit that measures the movement of the camera using an accelerometer and gyroscopic sensors.
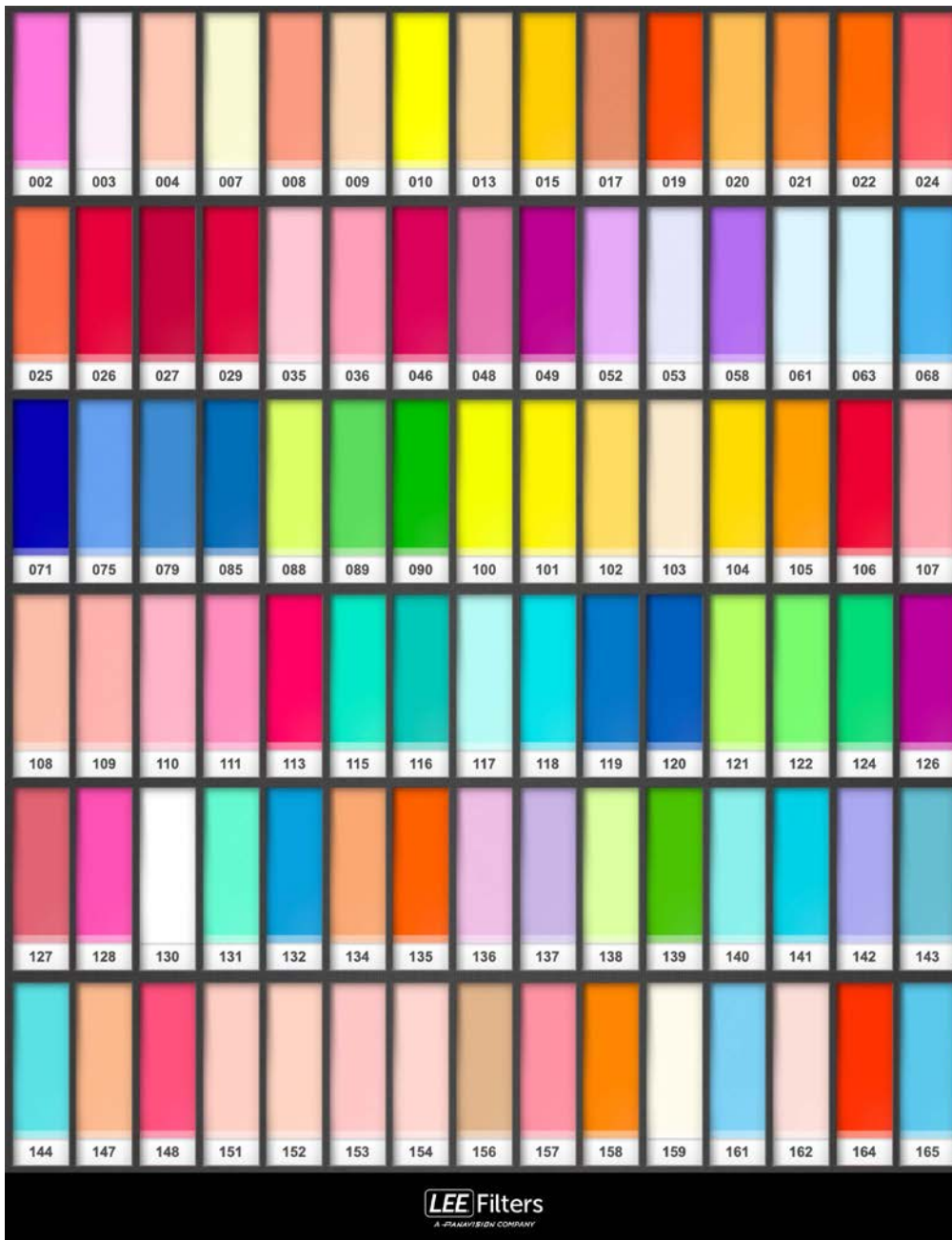
List price for the complete M2-VLKIT (with V-Mount Battery Base) or the M2-ABKIT (with Gold-Mount Battery Base) is $25,500. The M-2 Volt (M2-V) list price is $6,250.

tiffen.com/pages/m2-core-kits   tiffen.com/pages/volt-system
tiffen.com

LEE Lighting and Camera Filters

LEE Lighting Filters

LEE Camera Filters

LEE Elements Big Stopper.
(ND3.0 = 10 stops of light reduction).

LEE Elements Circular Polarizer (CPL).

LEE Elements VND (Variable ND)
ND.6-ND1.5 (2-5 stops light reduction)
and
ND1.8-ND2.7) (6-9 stops).

If not for the LEE Filters logo at the bottom, this colorful display might be mistaken for an installation at the Museum of Modern Art. They are, at left, just a few examples of the 351 LEE color filters and diffusions available. The LEE line currently consists of colors like these, technical filters, reflection and protection, diffusion and LED filters.

LEE has a long history of making their own filters in their own factory in Andover UK since 1967. A note on terminology and spelling, since LEE is a UK company. They spell it colour and I spell it color. They call it filter and I call it gel. When I hear **filter**, it goes on the camera's lens. When I hear **gel**, it goes on the light.

LEE makes both, of course. Camera filters include the ProGlass

IRND, Variable ND and specialty filters for their popular drop-in systems like the LEE100 and LEE85. LEE also recently released LEE Elements, a new line of circular filters which includes the Big Stopper, Little Stopper, Polarizer, and VNDs (2-5 stops and 6-9 stops).

Jeffrey A. Reyes, General Manager of LEE Filters USA, said: "We are as committed as ever to our Lighting products and the creatives who use them. Light is, after all, the cornerstone of our art form. All image creation equipment is designed to essentially play with light: to produce it, control it, bounce it, shape it, alter it, focus it, capture it, emulate it, or project it. Everything is Light!"

MYT Works Optiglide Reticle & PAT-ACC Charts at Band Pro
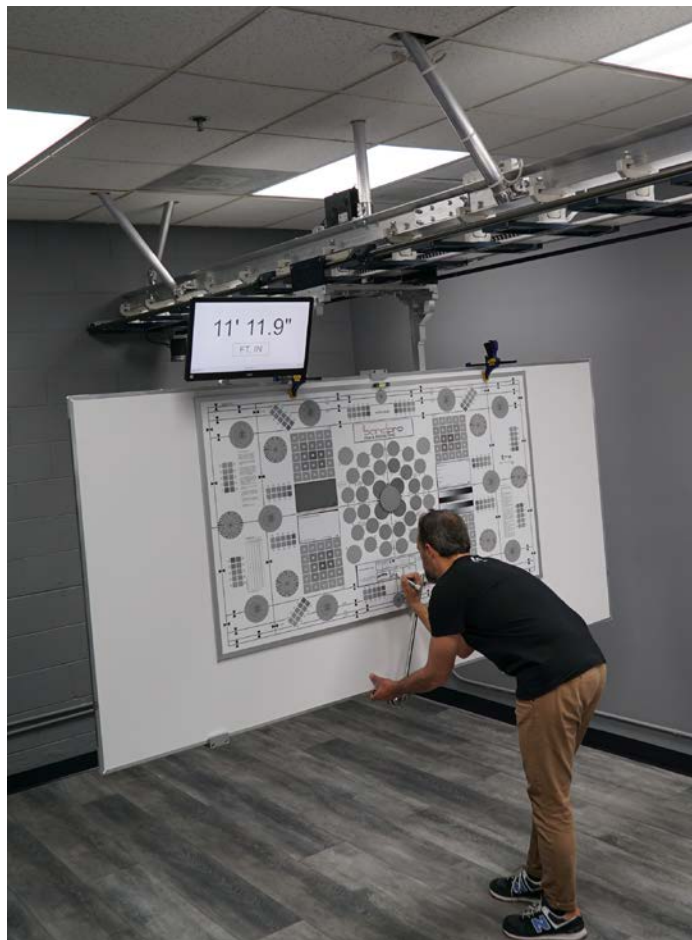
Stéphane Paillard, owner of PAT-ACC, is filling in the whiteboard slate of a Yotta Test Chart. Note the mirror in the middle to center the lens: when you see your reflection in the camera, you're centered.

The test chart and white lens projection screen are mounted on Etienne Sauret's MYT Works overhead Optiglide Reticle track with its calibration-free digital readout system in Band Pro's lens test room.

 For accurate line-pair measurements up to 8K, you want to position the camera's film plane at a distance of 50 times the focal length of the lens. So, with a 50mm lens, you should position the camera's film plane 2,500mm (2.5m) away. But, with MYT Work's Optiglide digital readout, you don't need a tape measure. It reads out directly on the overhead screen. Shown above: 11'11.9".

Stéphane checks calibration of an Optimo Primes focus scale with a PAT-ACC lens tape marked in 1mm back focus increments. This is a quick way for rental houses to check consistency before and after a job.

Above: Baard Sylling of MYT Works installing Optiglide Reticle system at Band Pro. In the setup, the projector and camera can be mounted on the same pedestal. They do not move; it's the projection screen and test target that move on the overhead track. Note the new image plane encoder mounted on a mini slider (in the photo above). It lines up with the image plane of the projector or camera, and you do not have to make any calculations of offset.

Below: Camera with lens and Chrosziel Lens Test Project mounted simultaneously.

Band Pro Lens Service

Amnon Band, President and CEO of Band Pro, discussed their recent advances in optics: "My first project with Angénieux began 5 years ago with the EZ zooms. At that time, we had one lens technician. Once I signed the Optimo Prime contract and then got exclusive Angénieux distribution for the America, I knew I had to raise the bar, with the most sophisticated optical test instruments and top-shelf technicians. It's a big responsibility. I went all the way with technology as well as personnel. That's why we installed a clean room, the latest MYT Works system, PAT-ACC 8K resolution charts, Chrosziel lens projectors, and more. We now have a state of the art, full-service, fully-equipped lens testing and repair depart.

"We recently hired technicians who can fix lens cleanses almost with their eyes closed. We're expanding, we're getting deeper and deeper into the lens repair and lens service, which by the way, educates us tremendously as to what to do next. We listen to customers coming in and giving us feedback. Emin Nalbandian and Ronald Monte completed a week of training at Angénieux. Ricardo Monte, who worked at Cooke, is next in line for Angénieux certification. In April, they are all getting ZEISS training.

"So, everything is connected. The training, the equipment, the personnel. If you want to be successful in the lens business, it comes with an investment. You need to be committed."

Emin Nalbandian, Band Pro Chief Optical Technician, repairing an S4/i.

Emin Nalbandian checking an Optimo Prime with a Sony VENICE in the lens test room. Emin oversees Band Pro's Optical Department, with two Full-Frame lens test projectors, collimator, MYT Works Optiglide setup, Class 100 cleanroom and more.

Ricardo Monte working on an Angénieux Optimo Prime.

Ricardo Monte joined Band Pro's Optical Department as Senior Lens Technician following 4 years at Cooke Optics. A cine lens-meister with a prolific career at Panavision South America, Visual Products, and Otto Nemenz, Ricardo's knowledge and technical expertise is famous.

Ronald Monte joined his father at Band Pro as a 2nd generation cine lens expert. His background includes work as a camera assistant and rental house prep tech. He had a thorough understanding of cine lens diagnostics, repair and fine-tuning. If this father-son team can't fix your lenses, probably no one can.

Angénieux Integrated Optical Palette in Optimo Primes

Angénieux Optimo Primes are Full Frame, easily, repeatable and quickly tunable. Their Integrated Optical Palette (IOP) lets cinematographers create unique looks by combining IOP permutations the way a painter blends textures and hues.

Just as Julius Caesar described in De Bello Gallico (ca. 50 BC) "All Gaul is divided into three parts," so are the Optimo Primes IOPs made up of three components. The swappable, 2mm thin internal palette element sits inside the lens, between the focus and iris groups. There is a vast selection of internal elements for the palette—including Glimmerglass, Pro-Mist, Black Satin, Blue Streak, Hollywood Black Magic—in various grades. Lots more are on the way. Note: when the internal element is flat, Tiffen labels it "Optimo Prime internal filter," shown above.

Next comes the Iris Cartridge, with a choice of blades and shape, round, 3-bladed, oval anamorphaux, and so on. The Rear Filter is external, accessible from the back. Actually there's a 4th team of the IOP look customizing department: front filters.

Combining one or more of these paint brushes dramatically affects the overall look. Interestingly, because of their uniquely designed position inside the lens, IOP elements offer new looks not possible with front or rear filtration alone. For example, a 1/8 Black Pro-Mist inside the lens gives the image a vastly different look than if you a 1/8 Pro-Mist front filter.

Randy Wedick, Band Pro CTO explains, "Putting the internal element in the center of the lens seems to create bi-directional reflections. Light bounces off the front surface of the filter onto the front optical group, and off the rear surface of the filter into the rear optical group.

"This then kicks of a series of complex reflections, flares and interactions that you wouldn't get by putting the filter in the front of the lens (before the image is made), or on the rear (after the image is made). You are creating light interactions at the moment of conception of the image. It's why people like vintage lenses. But without the pain of vintage mechanics in vintage lenses."

Equally unique is that this process is easily reversible, returning the lens to its original configuration within minutes. Official stage one IOP options include Clear (Coated & Uncoated), Glimmerglass, Black Satin, Black Pro-Mist and Low Contrast from Tiffen; and Hollywood Black Magic and Blue Streak from Schneider.

Iris Cartridge Options include 3-Blade and Oval (coming soon). Rear Filtration options are available from Tiffen and Schneider Optics. Many more looks are in R&D right now, along with customized looks upon request. Band Pro will continue to seek cinematographers' and clients' suggestions and comments for future IOP releases.

Band Pro has a full-service optical department. Instead of breaking an internal element of the palette, as I did by dropping it on the floor, I suggest you let their experts swap yours, at least the first few times. Band Pro is exclusive distributor for Angénieux in the Americas at *bandpro.com*.

In EMEA, contact Angénieux at *angenieux.com* and in Asia/Pacific, *jebsenindustrial.com/angenieux/* for Jebsen CineCast.

Optimo Prime IOP Looks

50mm T1.8 with Tiffen Black Satin 1/8

50mm T1.8 with Tiffen Black Satin 1/8

135mm T1.8 with Tiffen clear coated

135mm T1.8 with Tiffen clear coated

Tiffen Optimo Prime internal elements, above and below, are 2mm thin.

Optimo Prime IOP Looks

28mm T1.8 with Tiffen uncoated clear

28mm T1.8 with Tiffen uncoated clear

24mm T1.8 with Tiffen Gimmerglass 1/8

24mm T1.8 with Tiffen Gimmerglass 1/8

24mm T1.8 with Tiffen Black Pro-Mist 1/8

24mm T1.8 with Tiffen Black Pro-Mist 1/8

Randy Wedick is Chief Technology Officer at Band Pro. He is a talented, working cinematographer, respected voice in the industry, with a great understanding of technique and technology from lens to living room, from capture to post.

Tim Smith joined Band Pro's executive management team as Chief Creative Officer. He is an Associate Member of the ASC. With three decades of experience as a senior advisor at Canon's Cinema Division, Tim has seen the introduction of countless products and formats. He is now looking forward to his new role at Band Pro and continuing to help cinematographers in their creative endeavors.

Swapping Optimo Prime Integrated Optical Palette (IOP) elements

1. Let's open an Angénieux Optimo Prime to swap the IOP element. Work in a clean room, not outside or in back of the camera truck.

You will need the Angénieux Optimo Prime IOP Tool Set.

2. Randy Wedick takes us through the process. It is easier than I expected.

Do not attempt unless you are a trained lens technician or have been trained by one.

Wear gloves. Halyard Purple Nitrile ones are stylish and make it easier to find loose black screws than if you wore cool black gloves.

Store those screws in a lens rear cap or similar container.

Ready to swap the IOP Element of a 28mm Angénieux Optimo Prime? Let's go:

3. Remove outer retaining ring with 8 screws. Use a magnetic screwdriver. Some lenses have a threaded shroud—use Front Ring Spanner.

4. Thread the front group spanner onto the lens group.

5. Remove 8 more Phillips head screws. Remove O-ring.

6. Extract the entire lens group assembly.

7. Revealing a Tiffen Optimo Prime internal element.

8. Thread the Inner IOP Tool onto the inside of the IOP ring.

Swapping Optimo Prime IOP elements

9. Insert the Outer IOP Tool to unscrew the IOP retaining ring.

10. Remove the IOP Outer IOP Tool.

11. Extract the Inner IOP Tool with the internal element and retaining ring attached.

internal element

12. The iris assembly is seen below the internal element. This is where you begin to swap the iris assembly using the same inner IOP tool to remove it.

13. Unscrew the internal element.

14. Remove the retaining ring with the internal elements spanner.

15. Out comes the internal element, ready to be swapped for another.

16. "Rewind" in reverse order to put it all back together.

Sony a7 IV Focus Mapping

5-axis 33 MP sensor in-body image stabilization

Focus Mapping

Sony a7 IV Focus Mapping is a color overlay in real time that shows degrees of focus—near, sharp or far—as shades of blue and red. When your subject is in focus, that area is revealed as a transparent window.

When you are focused in front of the subject, close focus turns shades of yellow and red. When you are focused behind the subject, far focus appears as shades of blue. The deeper the color, the more out of focus you are.

The memory jogger is to think of red as something warm: the closer you are to a fireplace, the warmer you get.

The OLED viewfinder, with 3,686,400 dots, is so fine you can usually determine critical focus without having to press the image magnification button.
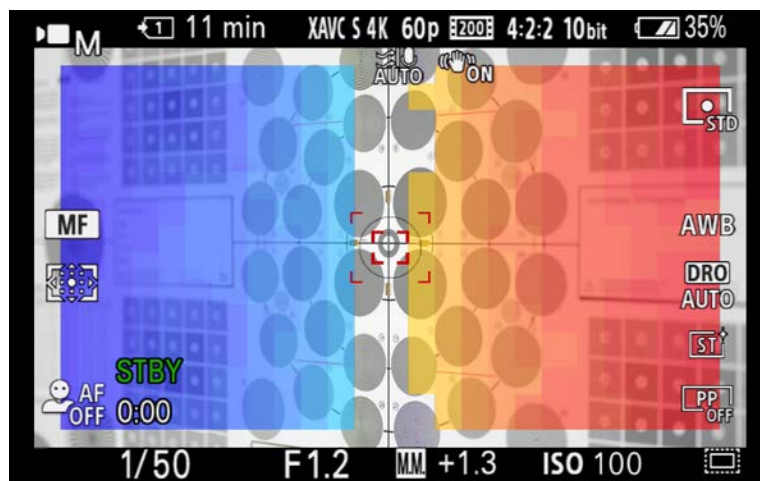

Focus Mapping is turned on. Chart is at 45° to camera. At F1.2, depth of field is shallow, as show by vertical white (actually clear) area at center. Far focus is mapped in gradations from indigo to light blue. Near focus is mapped to warmer reds and yellows.
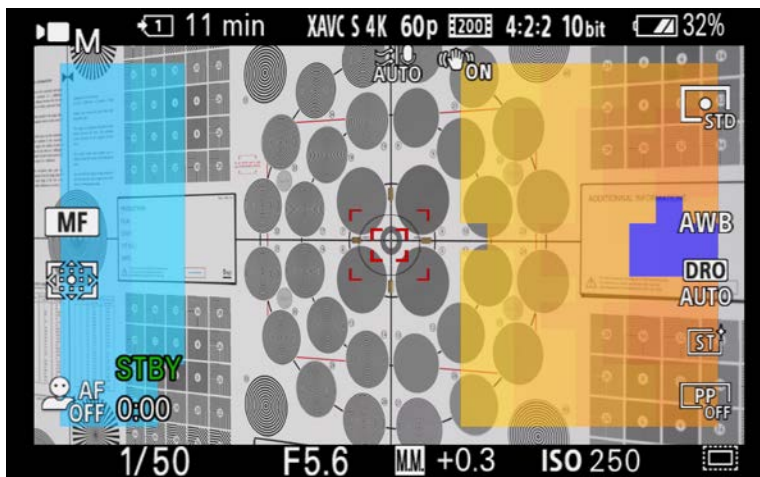
At F5.6, depth of field is deeper, as shown in the wider white/clear vertical area in the center that is in focus.

The chart is a PAT-ACC EXA chart from Prêt à Tourner Accessories, *pat-acc.com/en/*

Focus Mapping on Sony a7 IV
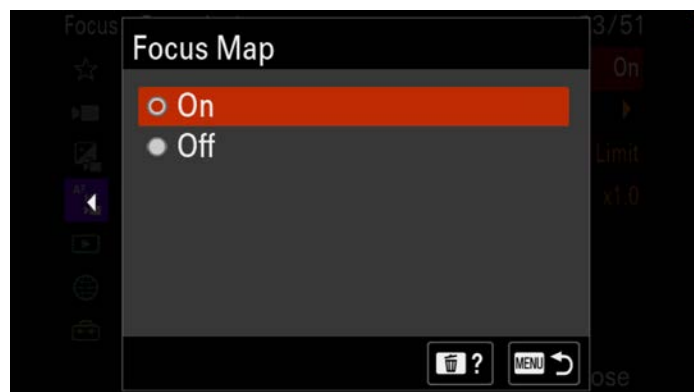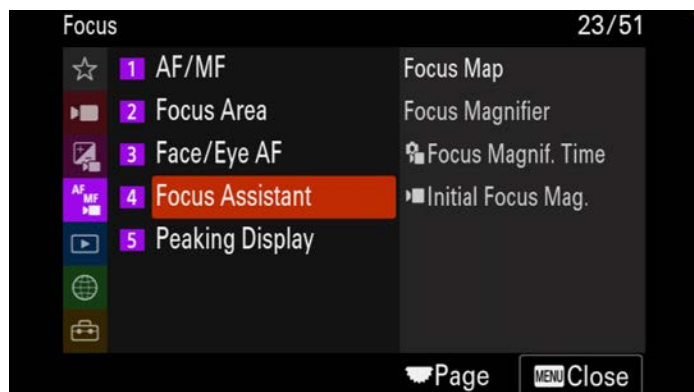
Turn Focus Mapping on and off with the menus. Go to: Focus > Focus Assistant > Focus Map > On.

Assign a Custom Button to Focus Mapping
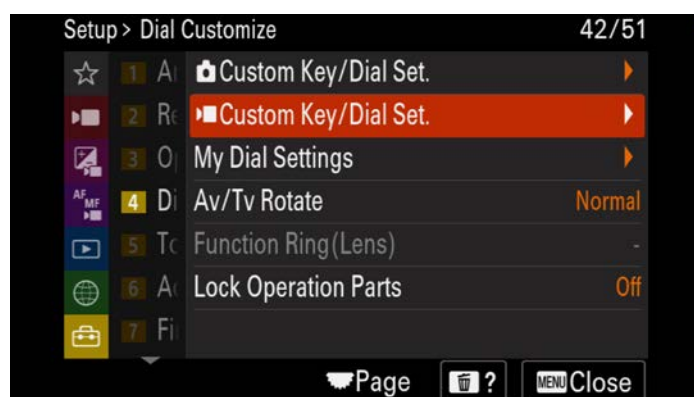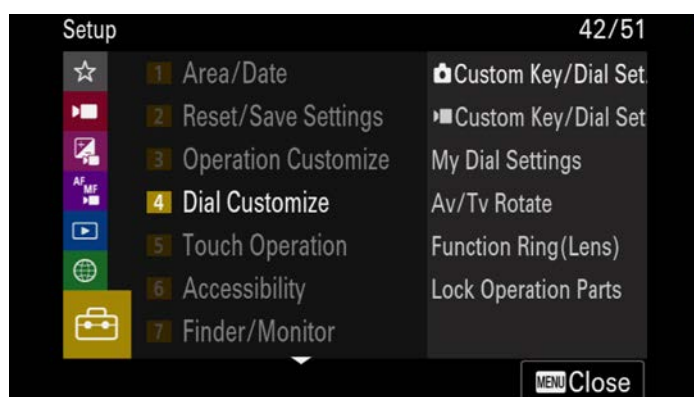
Focus mapping is a good function to assign to a custom button. I like C3. Go to: Setup > Dial Customize > Custom Key /Dial Set (Move Mode) >
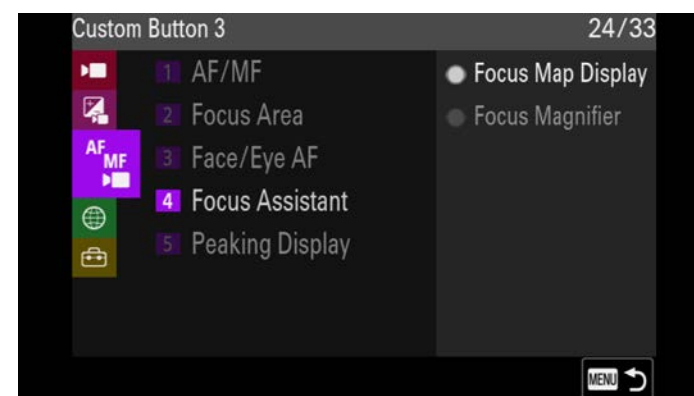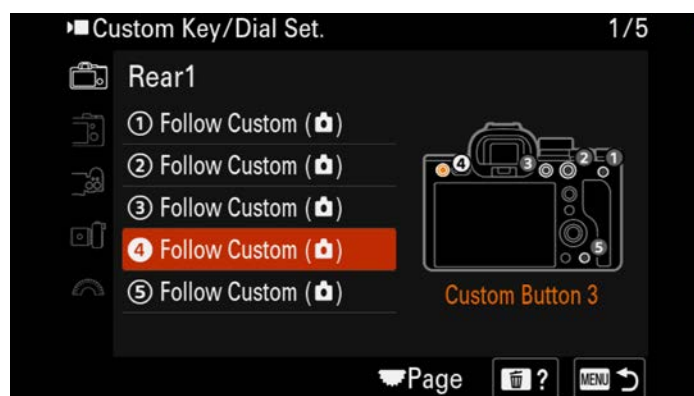
Navigate to Rear 1 > 4 Custom (which is actually Custom Button 3 C3 on the camera back) > Navigate to AF/MF > Focus Assistant >
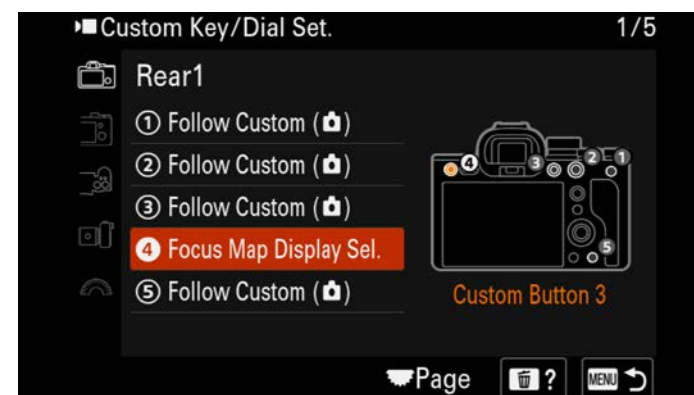
> Select Focus Map Display > Push SELECT to confirm... C3 is set to Focus Map Display. Push MENU to set. Now, C3 toggles Focus Map ON and OFF.

Sony a7 IV Focus Breathing Compensation

Sony's a7 IV (ILCE-7M4) has two fascinating focus functions: Focus Breathing Compensation and Focus Mapping.

Focus Breathing Compensation corrects lenses that appear to zoom in or out as you focus. With focus breathing compensation turned on, a relatively inexpensive lens might become as breathless as a Master Prime.

At the moment, Focus Breathing Compensation works with about 16 Sony only lenses. It is also found on Sony FX6 cameras with Version 2.0 firmware.

It's implemented so well and works so seamlessly that perhaps this technology might foreshadow additional Sony cine cameras to come. And, wouldn't it be nice if lens metadata, supplying predefined, mapped breathing parameters, could be nimble enough for camera processing engines to keep up and make corrections in real time, as they do on the a7 IV?

Around 1190, Maimonides wrote *The Guide for the Perplexed*. In 2002, Werner Herzog ("Pelicula O Muerte") substituted "A" for "The" with his: *A Guide for the Perplexed*.

Whenever perplexed by a new camera or lens, I seek Mark Weir, Sony Senior Manager of Technology, for enlightenment.

Mark explains:

- Each Sony lens compatible with the Focus Breathing Compensation function includes data identifying the field of view (FOV) shift behavior through its range of focus distance.
- This data is used by cameras that include the Focus Breathing Compensation function — the Sony a7 IV, in this case.
- When you activate Focus Breathing, the camera engages its Clear Image Zoom function and a field of view crop (depending on the behavior of the lens) continuously offsets changes in the FOV as the focus group of the lens is shifted to change the plane of focus. This all happens in real time.
- To do this, the camera must maintain awareness of the position of focus group inside the lens, the FOV behavior of the

lens at different focus positions, be able to calculate and apply the appropriate change in frame magnification with Clear Image Zoom. It's quite a computationally intensive process.

- There are some limitations:
- So far, the Focus Breathing Compensation function is only available on the a7 IV and FX6 with firmware v2.0.
- The camera's requirement for information from the lens limits the number of lenses that support the function, and only Sony lenses have this capability. I believe there are 16 lenses currently compatible.
- Focus Breathing Compensation is not available for video frame rates above 60p. It will not operate at 100p/120p.
- Although response from users of the function is quite positive, Focus Breathing Compensation is a computational process, so the accuracy of FOV and image quality may vary slightly.
- Focus Breathing Compensation is not available for still photography — only video.

I hope these five pages show how much I was thrilled by these functions and hope they appear in many more cameras to come.

For Focus Breathing Compensation, be sure the Still/Movie/S&Q dial is in the Movie mode.

Sony a7 IV Focus Breathing Compensation
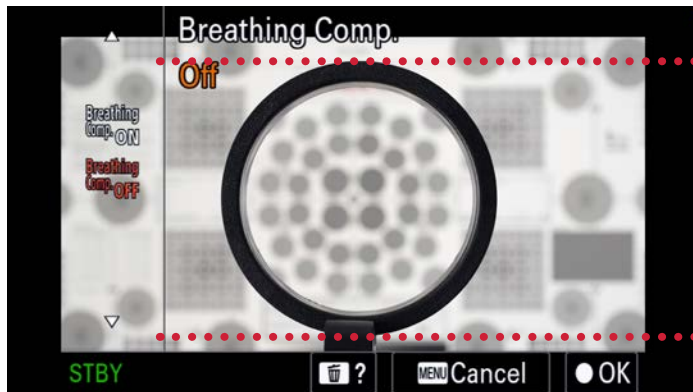
Breathing Comp OFF. T8.0
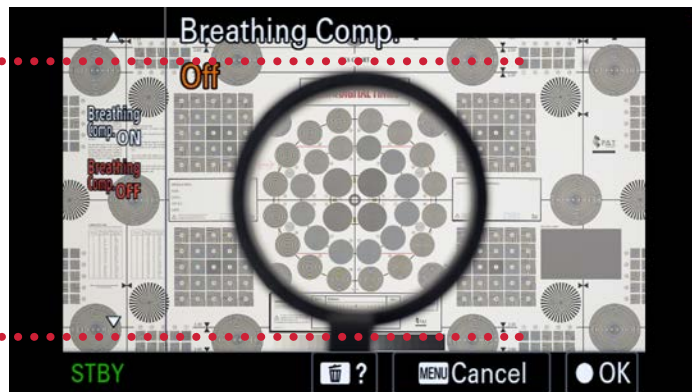
Breathing Comp OFF. T8.0

Breathing Comp ON. T8.0
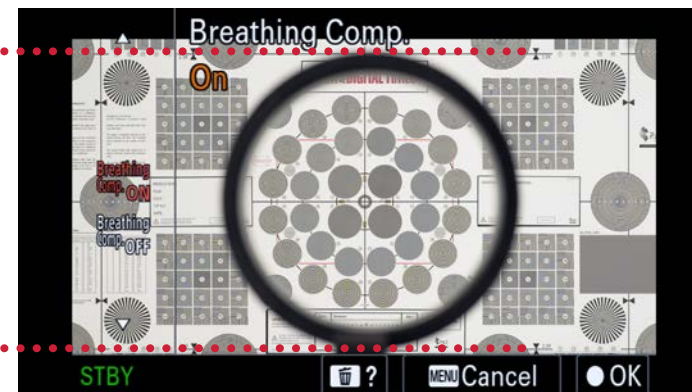
Breathing Comp ON. T8.0

Shooting > Image Quality > Lens Compensation > Breathing Compensation > On
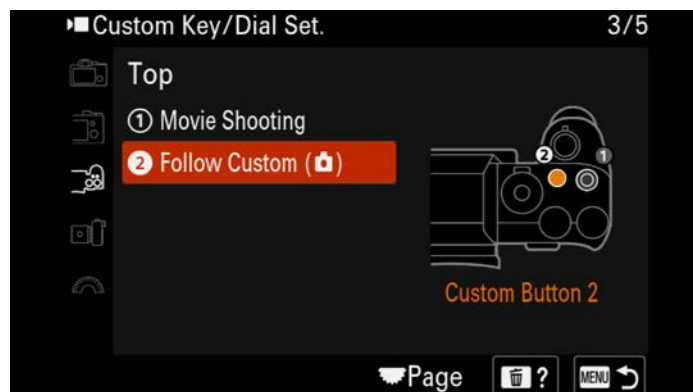
Custom Button C2 on the top of the camera is a good button to toggle Focus Breathing Compensation On and Off. Got to:
Setup > Dial Customize > Custom Key/Dial Set (Movie Mode) > Top > Custom Button 2 (C2) > navigate to Image Quality > Breathing Comp. > Push SELECT > push MENU to set.

Breathless Sony 16-35 F4 Zoom

Chart Tape

Actual Size: Sony FE PZ 16-35mm F4 G on Sony a7 IV

Stop the Presses! No sooner had the a7 IV camera's Breathing Compensation function was causing light-headedness, Sony sent an astonishingly breathless new zoom lens—no breathing at all.

Sony's 16-35 F4 Full Frame Breathless Zoom is officially FE PZ 16-35mm F4 G (model SELP1635G). (Maybe F for Full Frame, E for E-mount, PZ for Power Zoom, G for G series lens).

There so many things about this lens to take your breath away— and it's not just the absence of breathing. Just two pages earlier, breathing compensation was vaticinated in more cameras to come. Well, if breathless lenses like this 16-35 F4 are to come, you want to debate the soothsayer. Or enjoy both methods.

There is so much advanced opto-mechanical-electronic technology stuffed into this 16-35 F4 lens that it is difficult to know where to begin. But let me breathlessly try.

The Sony 16-35 F4 is tiny: 3.47" / 88.1 mm long, with a front diameter of 80.5 mm / 3.17" (front filter diameter 72 mm). It weighs a mere 12 oz / 353 g. A constant companion for cine and stills.

To join the Jabberwocky, "O frabjous day! Callooh! Callay! I chortled in my joy." The focus marks are actually repeatable. There's a

slide switch to go from Auto Focus to Manual Focus. Even though it continues to be a "focus by wire" arrangement, focus marks continue to be repeatable even after the camera is turned off. Attach two strips of ⅛" chart tape and calibrate the old fashioned way, by eye. See photo above.

You do not even have to slide a switch to go from silky smooth manual zoom to silky smooth power zoom, activated by a cute little slider on the left side. The aperture ring is marked in linear stops from F4 - F22 with an Auto Iris setting at the extreme camera left end of the ring. Of course, there's a iris declick switch; of course aperture remains constant while zooming in or out; of course the zoom is parfocal; and of course the lens is rectilinear.

Inside the FE PZ 16-35mm F4 G, there are two advanced aspherical elements, a conventional aspherical element, a super extra-low dispersion element and two ED glass elements—to control chromatic and spherical aberration.

Minimum focusing distance from the image plane is 11" /28 cm at 16mm and 9.5" / 24 cm at 35mm, with a maximum magnification of 0.23x. Please don't hyperventilate when you see the very affordable price: US $1,200.

Nanlux Evoke 1200

Nanlux's new Evoke 1200 is, as the name suggests, a 1200 W CoB (Chip on Board) LED fixture with light output comparable to an 1800 W PAR or 2.5kW HMI Fresnel.

There are 2 models: Daylight 5600K and Tungsten 3200K. Accessories include Fresnel lenses, softboxes (parabolic, octagonal, square and lantern) and reflectors with beam angles of 26°, 45°and 60°. The bare fixture has a 120° beam angle.

- At 3m with the bare 5600K fixture, you get 514 fc / 5,532 lux.
- At 3m with an 11° Fresnel on a 5600 fixture, you get a lot of light: 6,065 fc / 65,280 lux.

Dimensions without yoke: 330×241×210mm / 12.99×9.48×8.26"

Dimming 0-100%, flicker-free. TLCI: 97. CRI: 96.

Weight: Light Fixture: 6.94 kg / 15.3 lb
Power Supply: 10.5 kg / 23.14 lb
Yoke: 1.84 kg / 4.05 lb

For more information and complete specs: *nanlux.com/en/*

Nanlite PavoTube T8-7X

In future sequels to *Harry Potter*, I imagine the students of Hogwarts will no longer browse for the wooden wands that make the wizard at Ollivander's Wand Shop in Diagon Alley. Instead, they will go to Nanlite and get Nanlite LED tube lights for wands.

As a spokesperson at Nanlite said, "The creative potential brought to life by PavoTube T8-7X is as miraculous as a magician's wand."

Nanlite's Managing Director, Nancy Zheng said, "We are very confident that this little tool, with its slender shape, will have an influence on the market just as the concept behind the light suggests."

The concept is a thin (3.9 cm / 1.5") RGBWW LED Tube with bi-color, 2700K-7500K and RGB colors capable of 0-100% dimming and effects. Light output is 497 lux at 3200K and 528 lux at 5600K.

Length: 102.2 cm / 39"   Weight: 0.28 kg / 0.6 lb
Power: 5V DC at 2200 mAh   Rechargeable Li-Ion battery
DMX and Bluetooth control   97 TLCI and 96 CRI

http://en.nanlite.com/

Canon EOS R5 C

Shutter closes when camera is off—helpful when changing lenses.

Shutter opens to reveal sensor when the EOS R5 C is turned on.

Canon EOS R5 C is a Full-Frame mirrorless, RF mount, 8K, 45 Megapixel hybrid video and still camera.

From the front, the R5 C looks very similar to the R5, which launched in 2020. Both are about 5.6" wide x 3.8" high. But the R5 C is about an inch thicker, at 4.4" compared to 3.46". The main reason is the active cooling system and fan inside to keep the camera cool on long takes. The extra depth of the camera also provides room for additional ports and controls. Function buttons are numbered 1 through 13, and nicely labeled with words.

There's a three-way main switch on the top left side to select Photo or Video mode and OFF. EOS R5 C is Canon's first camera to record internal 8K (8192 x 4320) 12-bit Cinema RAW Light up to 60 fps. It is also the lightest Cinema EOS camera at 1.5 lb / 680g (body only).

There are two internal slots: one CFexpress and one SD. You can record internal RAW Light to the CFexpress and, simultaneously, a proxy or XF-AVC file to the SD card (V90 300 MB/s recommended).

It also manages relay recording from one card to the other.

Cinema RAW Light is also found on Canon's EOS C200, C300 Mark III and C500 Mark II. File sizes are significantly smaller than standard Cinema RAW. Cinema RAW Light comes in 3 varieties: RAW HQ (high quality), RAW ST (standard quality), and RAW LT (light recording). All three modes are 12-bit at every frame rate.

- FF 8K RAW Light ST 12-bit up to 30 fps at 2.0 Gbps data rate.
- RAW LT to 60 fps at 2.6 Gbps. But not RAW HQ.
- 4K 120 fps FF uncropped and 4:2:2 10-bit XF-AVC and MP4.
- Timecode mini jack (DIN 1.0/2.3. Canare recommended).
- HDMI RAW Output.
- Atomos Ninja V+ will record ProRes RAW from the R5 C via HDMI up to 8K 30 fps.
- 3.2-inch variable-angle LCD monitor and 5.76 million-dot viewfinder.

Camera right side with one CFexpress and one SD UHS-II slot

Camera left side ports: HDMI Out, USB-C, Timecode, Mic, Headphones

EOS R5 C Movie Mode

Video mode

Video mode displayed on an external monitor

Video mode shown on rear 3.2-inch variable-angle LCD display.

Video menu to format card (Initialize Media).

EOS R5 C Photo Mode

Photo mode
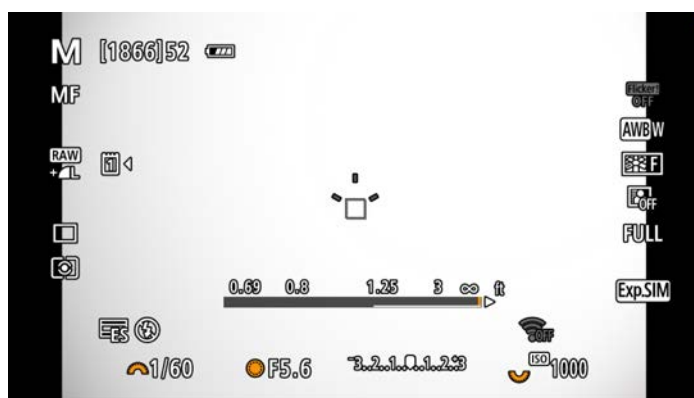
Photo mode displayed on an external monitor.

Photo mode shown on rear 3.2-inch variable-angle LCD display.
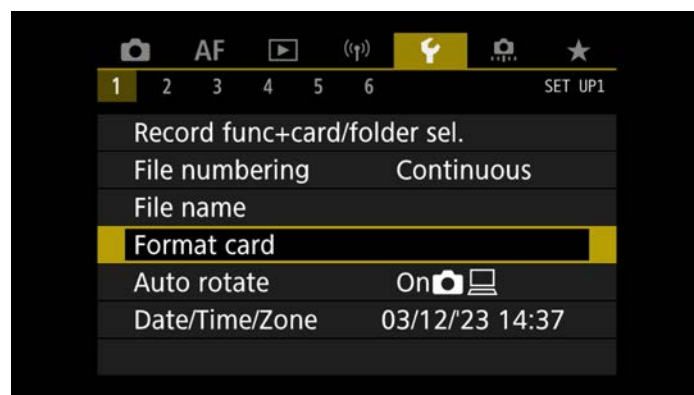
Photo menu to Format Card.

Canon R5 C Manual Focus Guides
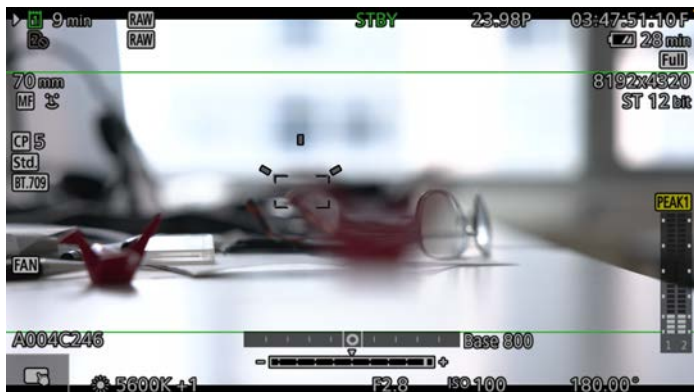
1. You are focused quite a bit in front of the subject in the center rectangle marker. The outer white arrows tell you to focus further away.

2. You are still focused too close. The arrows pointing up and out are now thicker, indicating you are nearing sharp focus.

3. Almost there. The arrows still point up and out, telling you to focus deeper. The rectangle can be repositioned with the joystick.
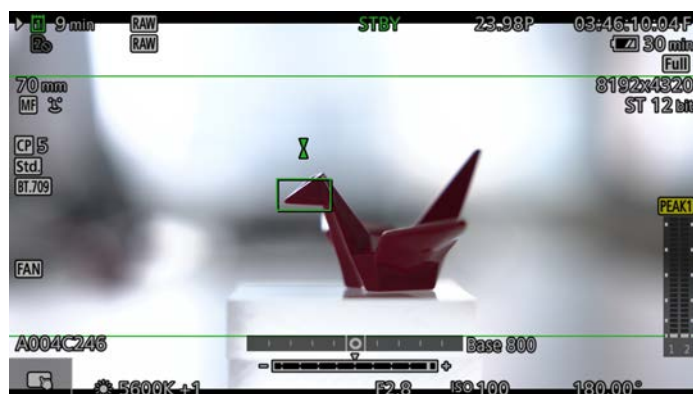
4. You're in focus. The area within the rectangle is sharp and the rectangle has turned from white to green.

5. In this example, you are focused too far away. The arrows point down, telling you to focus closer, nearer.
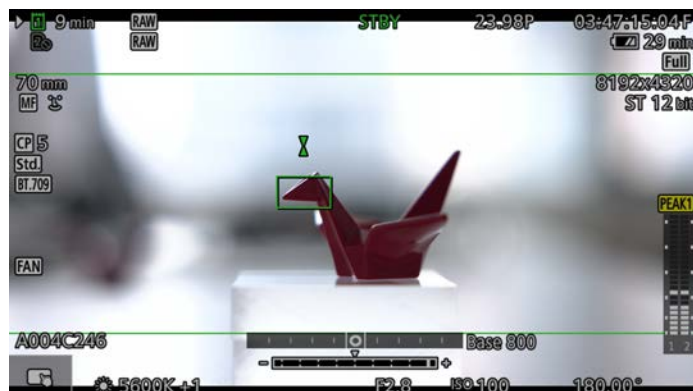
6. You nailed focus. The rectangle has turned from white to green.

Canon RF100mm F2.8 L MACRO IS USM on EOS R5 C

Canon RF100mm F2.8 L MACRO IS USM provided by Lensrentals

Bright Tangerine Rangefinder Bracket

Cine Tape
Rangefinder Bracket

Bright Tangerine's new Rangefinder Bracket fits their Misfit Kick, Kick 360 and ARRI LMB matteboxes.

The bracket has a pivoting base to attach focus measuring devices like Preston Light Ranger 2, Cine Tape, CineRT Focusbug, or ARRI UDM-1. Previously, when attached on top of a mattebox, this can obstruct filter or lens changes. So you remove have to remove the focus device, and then recalibrate it when reattached.

Bright Tangerine's Bracket addresses this dilemma by letting you swing the focus measuring device away—for unobstructed access. You can then swing it back to its original position and thereby avoid wasting time to recalibrate.

A knurled locking knob secures the bracket and has indents at 45-degree increments. The bracket slides left and right on a rail with 3/8-16 anti-twist mounts that is also compatible with the ARRI LMB and ARS range of accessory rails. The Bright Tangerine Rail attaches with two bolts to the upgraded top flag brackets on the Misfit Kick & 360. There are safety stops at each end.

Rail

Bracket

Bright Tangerine KASBAH System

KASBAH System – Shoulder Pad Kit consists of, L-R: Shoulder Pad 15mm Rear Bracket, Shoulder Pad, and Shoulder Pad ARRI Dovetail Riser.

What does Bright Tangerine's new KASBAH Shoulder Pad have in common with an adidas 4D midsole, a Riddell Diamond helmet liner, and a Specialized S-Works Power bicycle saddle?

They are all manufactured using Carbon's Digital Light Synthesis (DLS). Carbon Inc. engineers explain: "DLS is a rapid 3D-printing process that uses digital light projection, oxygen permeable optics, and programmable liquid resins to produce polymeric parts with exceptional mechanical properties, resolution, and surface finish. The Carbon DLS system enables radically reimagined products by introducing impossible geometries and lattice structures."

Andy Subratie, head of Bright Tangerine, explains KASBAH: "The shoulder pad has a unique matrix structure with an infinite number of density zones. So, it conforms to your shoulder for an extremely comfortable fit. The open structure allows air to flow through naturally, evaporating perspiration, and keep you cool. Camera operators will experience a new level of comfort and freedom to move during long hours on set and location. Extremely durable, sturdy, capable in extreme conditions, the pad is easy to clean with water and is UV resistant."

The KASBAH Shoulder Pad can attach to the rear of a Bright Tangerine Left Field 15mm Lightweight Support Baseplate. You can slide Baseplate and Shoulder Pad together onto any standard ARRI-style dovetail. You can also attach almost any other baseplate on top of the Shoulder Pad. And it pairs nicely with Bright Tangerine's KASBAH 15mm LWS/19mm Handle Kit, shown here:

- Variable density zones in handles use the same KASBAH DLS open structure for air flow, heat dissipation and comfort.
- Wide range of articulation.
- 3/8x16 Anti-twist and 1/4-20 threads for accessories.

AJA Io X3

AJA's Io X3 is a new, compact and portable Input/Output device. Think of it as an air traffic controller in a box, sending SDR or HDR video and audio to and from your Thunderbolt 3 equipped laptop or computer.

A few real-life examples of using an AJA Io X3

1. But you're not an Air Traffic Controller. You are a DIT on location. Four cameras are sending 3G-SDI 1080p video output to your cart. The director wants to toggle between a quad split of all four cameras and also to view full screen of each. Connect each camera to Io X3's four SDI inputs. Connect an HDMI monitor to the output.

2. You are editing in Apple Final Cut Pro, Avid Media Composer or Adobe Premiere Pro and you want to view in HDR on an HDMI monitor and simultaneously in SDR on a 3G-SDI monitor.

3. You are sending a rough cut to the producer and want to narrate where additional scenes are required in the timeline and, gasp, which ones need to be reshot because they are, exhale, out of focus. Plug a microphone into the computer's USB port and connect the Io X3 between an AJA HELO (Stream-Record-Deliver) box and an Internet connection.

4. You're working in any number of apps compatible with Io X3: Unreal Engine, Flame, After Effects, Photoshop, Colorfront Express Dailies, QTake Video Assist, Assimilate Scratch, etc.

About the AJA Io X3

Io X3 from AJA Video Systems is a high-end video and audio Input/Output device for 2K or HD (HDR or SDR) capture and output — bridging the worlds of 3G-SDI, HDMI and Thunderbolt 3. Io X3 enables high-quality HDR I/O up to 2K/HD 60p on compatible Thunderbolt 3-equipped Macs or PCs running NLEs and other professional software. If you know AJA's T-TAP Pro, this is like a much more advanced and caffeinated T-Tap Pro.

Whether working on-set, in a studio or post-production suite, AJA's Io X3 is a fast, nimble, and mouse-quiet capture and output

Io X3 example 1: Four cameras, no waiting. Director wants to see one full screen or a quad split of all four.

AJA Io X3

device for many applications, including on-set monitoring, playback, editing, grading, audio mixing, remote editorial and VFX.

AJA Io X3 Details

- There are 4 independent 3G-SDI In-N-Outs...er...inputs/outputs and two HDMI inputs/outputs.
- The 4 3G-SDI bi-directional BNC connections support single-, dual-, or multi-link I/O up to 2K/HD p60 YCbCr 10-bit or 30p RGB 12-bit.
- HDMI 1.4b I/O up to 2K/HD p60 YCbCr 10-bit or 30p RGB 12-bit I/O.
- Dual Thunderbolt 3 USB-C ports connect to Macs or PCs and support daisy chaining—e.g. external drives.
- HDR support on SDI and HDMI ports
- MultiViewer to display up to 4 inputs on one HDMI monitor.
- Latest macOS Monterey and Windows 11 support and compatibility across both Apple M1 chip and Intel computers.

- Optional rackmount kit. You can rack mounting 2 Io X3s side by side, enabling up to eight channels of HD I/O in 1RU.
- 8-channel analog audio I/O via DB25 connection.
- Analog audio ports are switchable between input and output, letting you swap between 8 channels in or out, or split between 4 inputs and 4 outputs.
- Up to 16 channels of embedded audio on each SDI port, and up to 8 channels on HDMI.
- 3.5mm stereo analog audio port for headphones.
- Reference, LTC input and LTC output BNC connectors.

AJA's free Desktop Software v16.2 software. It includes AJA's Control Room and Control Panel software to work with the Io X3. *aja.com/products/aja-control-room#support*AJA

Control Room software manages capture, monitoring, playback and output. AJA Control Panel software lets you set up and control the Io X3 and also update its firmware. More on the next page.
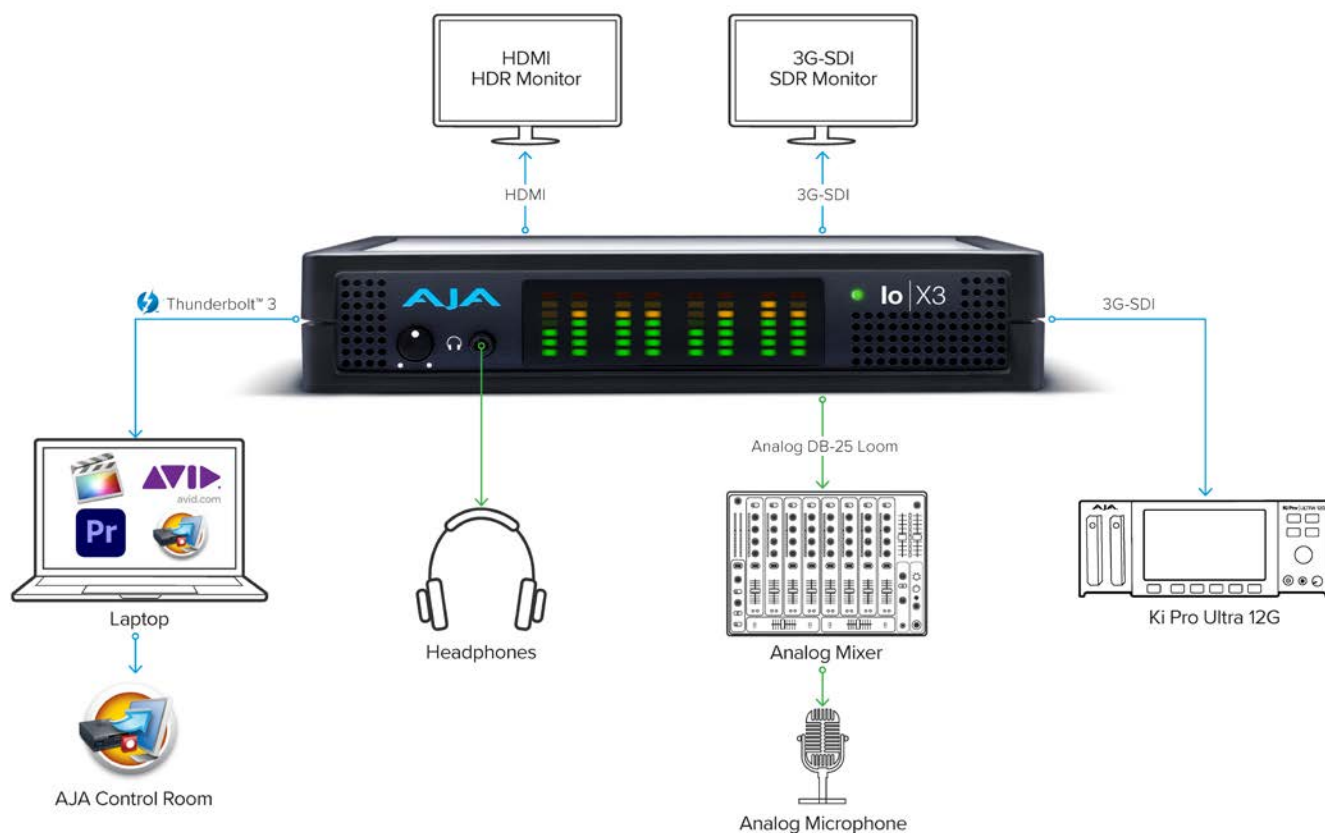
Io X3 example 2: Two client monitors, no waiting. HDR and SDR simultaneous viewing in the edit suite.
Photos and diagrams courtesy of AJA.

AJA Desktop Software v16.2
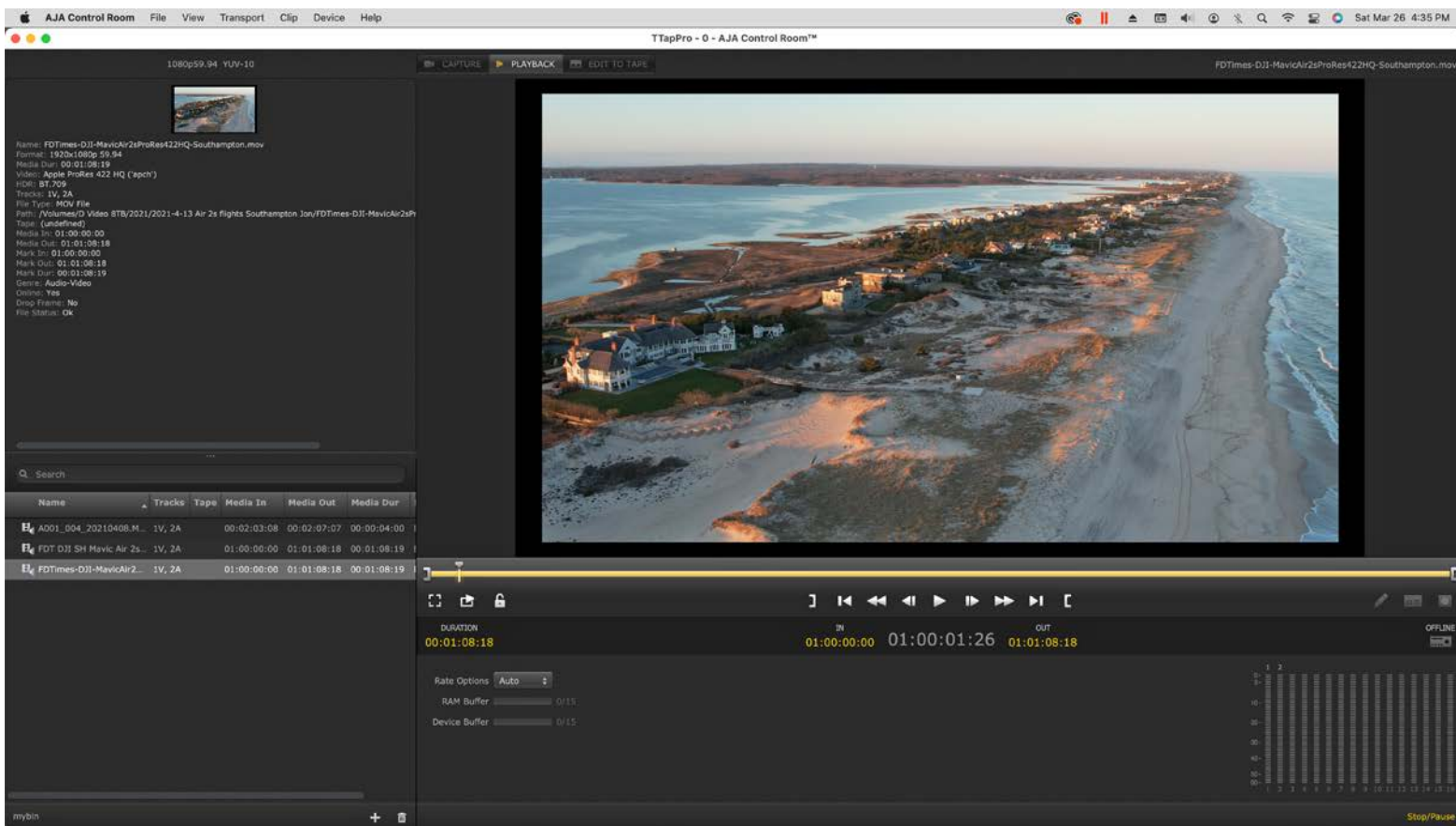
AJA Control Room

AJA Control Room v16.2 for AJA X3 Io

If you just got an AJA Io X3, described on the previous pages, then your next stop is online to download the latest version of AJA Video Systems free Desktop Software v16.2 software: *aja.com/products/aja-control-room#support*

AJA Desktop Software unpacks to four applications for Mac, Windows or Linux. Three are relevant to working with AJA X3:

- **AJA Control Room v16.2:**
  In, Play, Out. For pristine capture, monitoring, playback and output. AJA Control Room's UI is intuitive and elegant. Create bins, capture uncompressed video or choose from a range of compression options.

  Files can then be played out through an AJA X3 Io to an SDI or HDMI monitor.

- **AJA Control Panel v16.2**
  To set up and control of your AJA Io X3 (also AJA KONA, Io or T-TAP) and to manage firmware updates. Also does capture, playback and output.

- **AJA System Test v16.2:**
  To test data rates of your computer's spinning and SSD drives to see whether they can sustain the frame rates of the format you are working with.

What's new in AJA Desktop Software v16.2

- Io X3, AJA's latest Thunderbolt 3 In/Out Capture/Play device.
- Supports macOS Monterey and Windows 11.
- Multi-channel support for OBS Studio (v2.27 onwards) at up to 4K/UltraHD 30p and 2K/HD 60p for Io X3, T-TAP Pro, KONA 5, KONA 4, KONA HDMI, Io 4K Plus.
- Greater flexibility and more accurate, vivid 4K/UltraHD color with new 12-bit 4:4:4 RGB firmware update for KONA 5 and Corvid 44 12G, with full 12-bit support from capture to color space conversion and output. This comes with an upgrade to the .cube format for all 12-bit and 10-bit LUTs for greater compatibility between AJA hardware and third-party grading and mastering applications.
- 12-bit LUT support and .cube LUT compatibility enhancements with AJA Control Panel.
- H.264 and H.265 capture and playback with AJA Control Room, up to 2K/HD 60p, including Timecode and Closed Captioning support, and further provide seamless compatibility with mobile devices, PCs, and AJA Ki Pro GO media.
- With the introduction of Io X3, a new MultiView feature allows up to four incoming SDI sources to be monitored on a single external HDMI monitor.

AJA Desktop Software v16.2

About: AJA Control Room v16.2
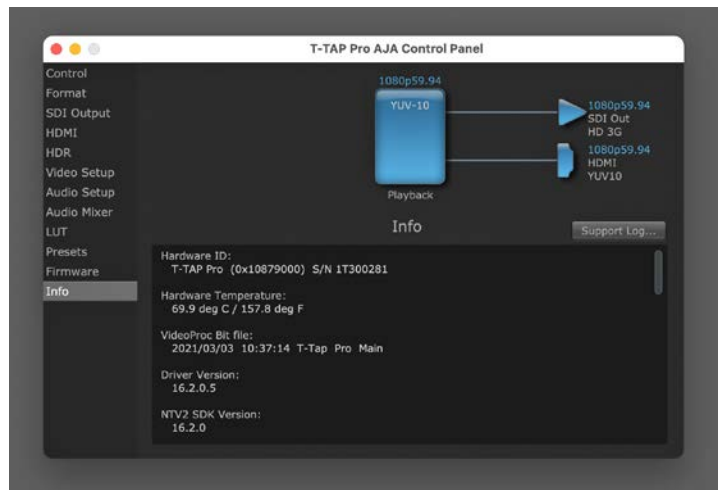
AJA Control Panel v16.2 Info page, shown connected to AJA T-Tap Pro.

- MultiView on HDMI output, offering display of multiple sources to one monitor, via SDK v16.2 and KONA 5.
- This release also includes new deep memory buffer capabilities for Control Room to maintain steady and pristine playback in the event that storage or network bottlenecks interrupt the flow of data from storage to the video output host.
- Access to the core AJA SDK for open source developers.
- 64/32 channel audio support for KONA 5, Corvid 44 12G, Corvid 88, and Corvid 44.

AJA Control Room v16.2 and OBS Studio

OBS Studio is free, open-source software for video recording, playback and live streaming.

Once Desktop Software is installed on a system running OBS Studio v27.2 or later, some AJA devices will be ready immediately for multi- or single-channel capture and switching up to 4K/UltraHD 30p and 2K/HD 60p.

AJA Control Panel v16.2 Firmware Update page. Dropdown menu selects a collected device.

Summary

Nick Rashby, President, AJA Video Systems, said, "Desktop Software v16.2 is a huge update. Ensuring the highest-fidelity imagery with wider color depth, support for 12-bit color during post-production and monitoring and is critical for any production wanting to achieve the desired look. Desktop Software and SDK v16.2 expand support for 12-bit RGB across our production-proven KONA, Io, Corvid, T-TAP Pro, and the new Io X3, while also introducing new capabilities to streamline complex workflows. We're also excited to open up the AJA SDK to input from global open source developers, whose contributions can foster new innovation and help drive the industry forward."

Free and Available

AJA Desktop Software v16.2 is available now as a free download from AJA's support page:
aja.com/products/aja-control-room#support

AJA SDK v16.2 is available to participants of the AJA Developer Program as a free download from AJA's Developer Partner site. The Open Source Developer community can access the AJA SDK from AJA's GitHub page.   *github.com/aja-video*

AJA System Test reading an 8 TB spinning hard drive. Note:
163 MB/sec (megabytes per second = 1304 Mbps (Megabits per second)
190 MB/sec (megabytes per second = 1520 Mbps (Megabits per second)

Chrosziel Servo for Fujinon Premista

Chrosziel's new Servo Drive Unit was developed specifically for Fujinon's three Full-Frame Premista zooms: 19-45mm T2.9, 28-100mm T2.9, and 80-250mmT2.9-3.5.

If you're working documentary-style or scrambling on a reality series, having right-handed lens control can be helpful. The 3 compact internal cine lens motors quickly engage and disengage for manual or motorized control of focus, iris and zoom. Because the Premista's external /i connector is covered by the Servo Drive Unit, it passes the data through a similar connector on the handgrip.

Chrosziel's Servo Drive for Premista weighs about 1.2 kg / 2.6 lb. A 5-pin LEMO power connector draws 12-30V DC, up to 3A.

The zoom rocker on top of the handgrip is smooth and variable. For remote head work, the Servo Drive lets you control focus, iris and zoom remotely without having to slow down to mount rods, external lens motors and cables. A Hirose 20-pin Fujinon connector enables a Chrosziel Magnum wireless FIZ unit, as well as most other compatible brands of wireless lens units, to control the Servo Drive's internal lens motors.

For multiple-camera rock concerts, events and sports, ENG or broadcast-style productions, Chrosziel's Servo Drive Unit's zoom and focus can be controlled with a standard Fujinon two-handle tripod setup plugged into the Hirose 20-pin connector. The iris motor can be accessed remotely as well.

Breaking news: Michael Burnham has joined the expanding Chrosziel team as International Sales Representative for the Americas.

chrosziel.com

DZOFILM FF 35-80 & 70-135 T2.9

DZOFILM introduces new Catta Ace Full Frame 35-80mm and 70-135mm T2.9 Cine Zoom Lenses. Each lens comes with a PL mount and an additional EF mount. Catta can supply additional E/RF/L/X/Z mounts. An LPL mount will be optional.

- 46.5 mm image circle.
- 16 bladed iris, T2.9-22.
- Body made of black magnalium alloy.
- Length: 187.5mm / 7.38". Front Diamter: 80 mm.
- 35-80mm weighs 1.64 kg; 70-135mm weighs 1.71 kg.
- 35-80mm consists of 20 elements in 15 groups.
- 35-80mm close focus: 2'5" / 0.74 m.
- 70-135mm close focus: 2'6" / 0.76 m.
- 70-135mm consists of 17 elements in 11 groups.
- Comes packed in a Pelican case and custom foam insert.

One Catta Ace Zoom cine lens (35-80mm or 70-135mm) with Pelican case, PL and EF mount is $3899. A a set of 2 lenses (35-80mm and 70-135mm) with Pelican case, PL and EF mount is $7499. The optional LPL mount is $219.   *dzofilm.com*

New IDX V-Mount and Gold Mount Batteries

DUO-C98P
V-Mount

DUO-C198P
V-Mount

ZEN-C98G
Gold Mount

ZEN-C150G
Gold Mount

Here is the next generation of the IDX V-Mount batteries, the DUO-CP series. There are 2 D-Taps. Newly added is a USB-C PD port for two-way power delivery and charging when used with the new UC-PD1 compact charger. The two other ways to charge are through the D-Tap Advanced using a VL-DT1. And, of course, with a V-Mount charger. In addition to the two shown above left, IDX also supplies a DUO-C150P.

For example, the DUO-C198P:

- Capacity: 193Wh 14.5V, 9.9Ah
- Max Draw: 14A (11V)/ 154W
- Weight: 2.42 lb

idxtek.com

Welcome to the first Gold Mount, aka Three Stud batteries from IDX—named ZENITH Series, ZEN for short. There are 2 D-Taps and a USB-C PD port for two-way power and charging with the new 60W UC-PD1 compact charger. The housing is antiviral and antimicrobial, as are the ones of the DUO-CP series, a nice touch.

For example, the ZEN-C98G, IATA compliant and cube shaped:

- Capacity: 97Wh 14.5V, 6.6Ah
- Max Draw: 12.7A (11V)/ 140W ‡
- Power Outputs: (1) D-Tap Advanced (80W), (1) D-Tap (80W), USB-C PD; Input/ Output: Max 60W
- Weight: 1.54 lb

DUO-C98P & C198P
side view with D-Tap Advanced &
battery level check

ZEN-C98G & C150G
side view with D-Tap Advanced

DUO-C98P & C198P
side view with D-Tap & USB-C PD

ZEN-C98G & C150G
side view with D-Tap & USB-C PD

Tilta Mirage Lightweight Mattebox with Wireless VND

Wireless micro motor

Top eyebrow closes completely over front of mattebox hood

4x5.65" filter clips in here

Wireless Hand Unit

Tilta Mirage Mattebox System

Tilta Mirage is an ultra-lightweight, modular mattebox system.

Out of the box and unzipped from its stylish pouch, it clamps directly onto a 95 mm front diameter such as ARRI/ZEISS Ultra Primes, Leitz Summilux-C, Summicron-C, and SIGMA Cine zooms and primes. Step-down rings let you mount the Mirage onto smaller lenses. It also comes with a 15mm rod support.

The first thing you notice is the weight. At 179 grams, the Mirage is as light as the traditional 4x5.65" filter that slides into a traditional mattebox.

The Wireless Variable ND module is superb. It consists of a geared, thin, lightweight 95 mm circular Variable ND filter pack that is housed in a thin metal filter tray. Attach the Mirage Micro

Motor with two screws, pair the hand unit, and turn the knob to control ND0.3 - ND2.7 (1-9 stops) wirelessly from up to 100 feet away. It also works well with a Circular Polarizing Filter.

The Tilta Mirage mattebox is modular. Side vents reduce windage. The top eyebrow closes completely. 95 mm round filters, Pola or VND filters load into an approximately 111 mm wide metal filter tray that slides in from the top. You can add a 4x5.65" filter inside the front hood and on front with a holder. And, Mirage is compatible with all Tilta Nucleus Wireless systems. Tilta is working with Vaxis on lightweight, very thin filters for the Mirage system.

tilta.com/shop/tilta-mirage-matte-box/

Wireless micro motor

Variable ND control knob

Wireless Hand Unit

Tilta Mirage Mattebox System

95mm round filter tray

Geared VND 95mm round filter tray with motor attached

Wireless Hand Unit

Wireless Control up to 100 feet of Variable ND0.3 -ND 2.7 (1-9 stops)

Mirage Micro Motor and Controller come with rechargeable 800 mAh 3.7V batteries. They are the same size as a standard AA battery. But an AA battery will not work.

Tilta Mirage Mattebox System with VND + Motor, step-down rings, 4x5.65 filter tray, eyebrow, accessories. $599

CINEPADS 7 Monitor

CINEPADS 7 front and left side: Menu dial and 3 user buttons.

CINEPADS 7 front and right side: SD slot, 3.5mm 3-pin headphone jack.

The new CINEPADS 7 monitor is a project of the prolific Lu Sheng, former film student at the Institut International de l'Image et du Son in Paris, cinematographer and a member of CNSC (Chinese Society of Cinematographers). CINEPADS 7 is a high-quality monitor at an affordable price for filmmakers everywhere. CINEPADS 7 is a 7-inch high-brightness, touch-screen and tactile-controlled on-camera, handheld or mountable monitor.

SDI and SDI+HDMI Models

There are two versions: CINEPADS 7 and CINEPADS 7HS.

CINEPADS 7 has two sets of SDI In-Out connectors so you can switch between two 3G-SDI sources. It can be auto detected or manually selected to your choice of two connected inputs.

CINEPADS 7HS has one set of SDI In-Out connectors and one set of HDMI In-Out connectors. It also conveniently provides signal cross-conversion, so HDMI to SDI and SDI to HDMI. The monitor will automatically detect the video input connector.

Design

CINEPADS 7 is designed with a durable and lightweight aluminum chassis. Its touchscreen DCI-P3 display is viewable in direct sunlight or under a studio 20K. There are choices of battery brackets and video inputs.

CINEPADS 7 monitor has an all-metal housing and corner bumpers to further protect it from drops or bumps. This reduces the need to attach a tempered film for screen protection.

Display

CINEPADS 7 has a 1920x1200 10-bit processing / 8-bit display LCD touch screen with 100% DCI-P3 color gamut. Framelines are summoned as presets or customizable aspect ratios. Anamorphic desqueeze ratios currently include 0.75x, 1.33x, 1.5x, 1.66x, 2x and 2.5x. The 1500 nit LCD screen has a 1200:1 contrast ratio with an anti-reflection and finger-food/donut/croissant-proof coating.

Controls

If the idea of besmirching the pristine screen proves too great, or if your cold-weather gloved fingers makes touchscreen operation impossible, then the manual push-buttons and menu dial on the left side are there to adjusts all settings.

Color

A color gamut selection in the menu lets you switch between Rec.709 and DCI-P3 color gamut. To ensure color accuracy over the long haul, CINEPADS color calibration software will be launched later this year.

Power

CINEPADS 7HS has 2 power connectors: a 2-pin LEMO for 10-34 V DC and a DC barrel connector for 12 - 15 V DC at ≥2.5 A. The dual SDI CINEPADS 7 has two LEMO connectors. The active power source is automatically detected.

For onboard batteries, an optional V-Mount bracket attaches with 4 screws. The CINEPADS 7HS model additionally accepts small NP L-series batteries like the Sony F-970 (7.2 VDC / 6300 mAh).

Ventilation

To mitigate the heat generated by the bright, 1500 nits display and high-speed computing chip, CINEPADS 7 has efficient temperature control. The large cooling holes on the back of the monitor are covered with nano-scale cloth to help withstand sand and spray. Internal cooling is controlled by an independent circuit that lets you adjust the fan speed.

UX

The User Experience is the result of feedback from camera operators, focus pullers, camera assistants and DITs. CINEPADS 7 has a shortcut menu for customizable and quick access to tools and commands, such as features such as sharpness, focus peaking, waveform, false color, image capture, image overlay, etc.

Screen Capture & Encryption

CINEPADS 7 offers encrypted screen capture to an SD card.

Why encrypted? If you ever had to check your smartphone at the studio door, you know that production is notoriously skittish

CINEPADS 7 Monitor

CINEPADS 7 rear: 2 set of SDI In and Out Connectors

CINEPADS 7 HS rear: 1 set of HDMI In and Out; 1 set of SDI In and Out

CINEPADS 7 HS with Sony NP L-Series (F-970) battery bracket

CINEPADS 7 with V-Mount battery bracket

about leaks. CINEPADS 7 encrypts screenshot files to secure the information and they can only be accessed on the CINEPAD.

Screen capture is helpful when you want to position actors or props with the help of an overlay By activating capture overlay, you can compare the position of the actors or props in real time against an earlier captured screenshot.

LUTs

You can import LUTs (Look files) using the onboard SD slot. CINEPADS 7 also lets you send the LUT-applied image downstream to additional monitors on set via the SDI or HDMI video output connector.

Price and Availability

CINEPADS costs US $899 — for either version: CINEPADS 7 or CINEPADS 7HS. The package includes:

- Monitor,
- P-Tap to 2 Pin LEMO power cable for CINEPADS 7
- or P-Tap to DC barrel power cable for the CINEPADS 7HS
- 2GB SD card
- Soft case.

Distributors so far include: JCineCast, the Cinematic and Broadcasting department of Jebsen Consumer in Asia.

www.cinepads.com

Tech Specs

- Weight 470 grams
- Size: 184 mm wide x 111 mm high x 20 mm thick
- Mounting: 4x 1/4-20 threaded sockets (right, bottom, back and top)
- Display: 151.2 x 94.5 mm IP LCD (7.02" diagonal)
- Resolution: 1920x1200, 332 ppi, 16:10 native aspect ratio
- 3G-SDI Input, YCC 4:2:2 @ 10-bits: up to 1080p60
- HD-SDI Input: YCC 4:2:2 @ 10-bit: up to 1080p30
- HDMI Input: up to RGB & YCC 4:4:4 @ 16-bit 2160p30
- Power Consumption: 17.3 watts at 1080p60, 100% bright, tools enabled) —1.4A @ I2V, 0.7A at 24V.
- Pixel Zoom: 1.1-2.0x & 2.0-8.0x via swipe up/down. Infinitely adjustable via pinch & zoom
- Image flip, image rotate.

Carstage in New York

Carstage in Long Island City, NY.

Carstage co-founders, l-r: David C. Smith, Paul Kobelja, Joseph White.

Paul Kobelja was waiting for me at Carstage, a couple of blocks from Silvercup Studios and the 59th Street Bridge as most of us New Yorkers call it, and not the later-renamed Ed Koch Queensboro Bridge. A car chase was in hot pursuit inside his stage against moveable active LED backdrop panels that were carefully placed for best reflections in windows and on the actors' faces. Paul is so articulate that there was no need to ask more than one question.

Jon Fauer: Please explain how your Carstage works.

Paul Kobelja: It starts with the need. The need that we identified is that a most efficient way to move the story forward in scripted narrative television is to put two characters in a car and they're going to start having a conversation. Invariably, that conversation is going to be about whatever it is that's going on in the story.

If it's a cop show, it's going to be two police officers talking about the murder scene that they just left and the suspect that they're going to go and try and find. If it's a hospital show, it's going to be about two doctors having a conversation about whatever difficult medical treatment they have to figure out for the patient that's at the end of their trip. If it's a lawyer show, fill in the blanks.

That said, it is not a very sought-after device. Not because it's too common, but because automobile work in a television show is not normally a budgeted thing. You don't go into the season saying, "I'm going to have car shots this many days during the course of the season." Those scripts are in various levels of completion when you start. The problem is that putting two people in a car to do running shots around New York City is expensive.

Either, you're going to have to get a process trailer, put a car on top and drag it through the city streets, or you're rigging the car and letting the actors try to drive and act, or you're going to tow it. But, these things involve company moves, police, shutting down streets, and any of a number of logistical requirements that generally add money and time. The other way is you can set up green screens on a stage, but most television shows don't have empty, unused space on their stages. Stages are expensive. You're only going to rent as many stages as you absolutely need for your show. You're going to fill that up with standing sets and you're not going to have a space to set up green screens for car work.

We knew that show runners wanted these car scenes, but they wanted them to be convenient and they wanted them to be inexpensive. How are you going to be able to make that car look like it's in various cities around the world in an inexpensive way that a television show can take advantage of when they need it?

I have been working for more than 10 years in this area that I call enhanced environments, which is essentially surrounding automobiles with large LED display screens to make them look like they're traveling through different locations. We are not the first people to do this. I always make it very clear that it was Harris Savides ASC and David Fincher on Zodiac who were the very first to do this. It really was the epiphany that started all of this. The people I knew at the company that provided that equipment introduced the concept to me. And that's when I went down the path of figuring out a way to actually make it affordable and more permanent.

You can't just put a car inside of an inward facing box and expect to get correct imagery. All cars have different shapes. Cars have character and you need to be able to be responsive to that character. Carstage isn't just an inward facing box. It's actually multiple screens, seven of them that can be angled to the dimensions of whatever automobile is in the center of that room. And whatever terminology you use, whether active backgrounds or virtual backdrops or volumes, you are carefully syncing cameras to displays.

More importantly, the screens are designed to adjust quickly and efficiently, so that moving your camera from point A to point B doesn't require production having to wait on the LED screens to be positioned. Rule number one, when you are a vendor providing a service to a show, don't slow the show down. They can never wait for you. You might say a more efficient way is to set up one screen in the background. And then anytime you want to change the angle, you twist the car. But that actually takes far too much time and that creates lighting problems for the crew.

So, rather than moving the car, the room needs to move wherever you need it to be, based on wherever the camera is. We knew that we needed to design a system that could move around the object quickly and efficiently. At Carstage, the screens are actually flown from the ceiling on motors and on rails. With just a simple push by one person, these large screens can be moved into position. We have shown that when the camera moves from one setup to the next, we actually will have our screens set up and ready to go before camera is actually ready for that next shot.

What we are doing is similar to rear screen projection. This is a logical extension of something that's existed for a hundred years. The difference is the way it is designed, and by using 21st century technology, my partners David C. Smith and Joseph White and I have simply come up with a faster, affordable and better way of doing it.

Preston Diopter, Dolly-Zoom, Expander and More Updates

Preston Cinema Systems has been hard at work on firmware updates for their Hand Unit 4, Motor Drivers MDR-3, MDR-4 and Panavision DXL MDR. Among the many, Diopter Focus Mapping, Lens Extender/Expander and Dolly-Zoom are eagerly awaited. The following details and instructions refer only to the Preston Hand Unit 4 (HU4).

Hand Unit 4 HU4 — v1.022 Summary

- Menu short-cuts for Lens Folders and Lens Functions using designated touch areas on the Home display.
- Lens Functions: Diopter focus mapping, Extender/Expander, Zoom Dolly, Constant Zoom Speed.
- Software versions shown for all units in system. The software versions are shown beginning with current versions; earlier versions are reported with dashes.
- Reverse direction for focus knob enabled.
- Iris scale display is scaled to limits set by user.

Menu Shortcuts

Two active touch areas—Lens Description and Lens Functions—are added to the Home screen.

Touch the Lens Description area (near right) and the Lens Folder containing the active lens will be shown (far right).

Touch the Lens Functions area and the setup page for that function will be shown. The active Lens Function is indicated with red text: DTR (diopter), EXT (extender), DZ (dolly zoom), CZS (constant zoom speed).

The new menu item "Lens Functions" requires that HU4, MDR-3 and MDR-4 software is updated to the latest versions:

- MDR-4 ver 1.064 or later
- MDR-3 ver 1.143 or later
- DXL ver. 1.023 or later

Lens Description

Lens Functions: DTR, EXT, DZ, CZS
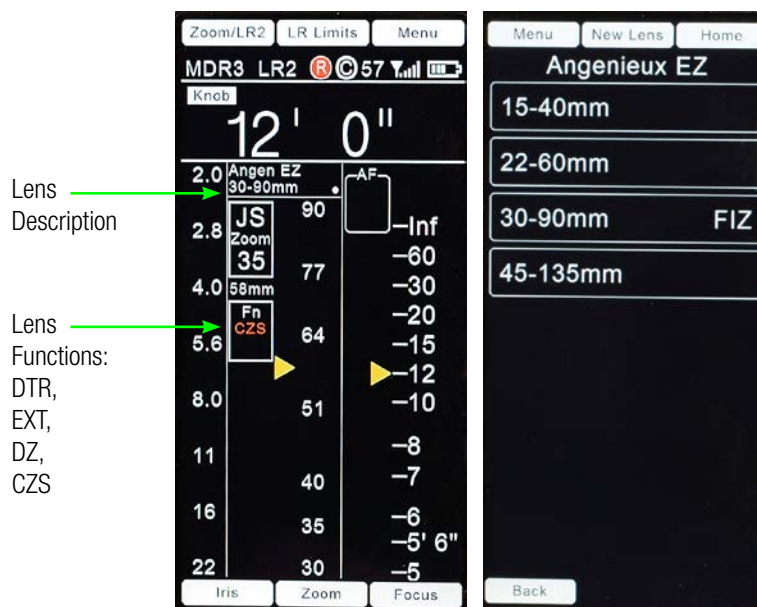
Lens Functions

1. The Lens Functions menu is accessed from the Home screen: Menu → Lens Functions or from the Lens Function touch area on the Home screen. Functions are selected by touching the rectangular virtual keys on the HU4 (picture at right).

Diopter Function (DTR)

This function re-maps the focus scale on the Home screen according to the diopter power and the lens entrance pupil position. The lens entrance pupil position is determined in the calibration procedure. The diopter calibration parameters are stored in the HU4 until changed by re-calibration.

If you have an MDR-3, using the Diopter function with the Light Ranger 2 autofocus function requires an MDR-3 with the current Kinetis processor or an MDR-4. MDR-3 Kinetis processor circuit boards were shipped beginning mid-2019. Contact tech@prestoncinema.com with the MDR-3 serial number and they will determine its processor version.

Summary of Preliminary Steps:

- Calibrate the lens with the HU4 or recall a lens from the Lens Library.
- Choose the "A" focus ring – minimum focus distance 9".
- If you are planning on using the Diopter function with the LR2, calibrate the LR2 offset.
- When changing lenses, the diopter calibration should be re-done to insure accuracy.

Preston HU4

Preston Diopter, Dolly-Zoom, Expander and More Updates

Diopter Calibration (DTR)

This requires a focus chart, an accurate measuring tape, or preferably a laser distance measuring device, and a stand/slider that allows millimeter-accurate positioning of the chart relative to the camera for sharp focus. Since calibration accuracy is crucial, Preston recommends that you choose Metric units (step 2, below) when entering distances from camera image plane to focus chart.

Step 1. Attach the diopter to the lens. Navigate to the Lens Functions page and select the diopter power.

Step 2. Set the lens focus to infinity and move the focus chart until the image is in sharp focus. Measure the distance from the focus chart to the image plane and use the virtual scroll wheel to enter the distance. Since accurate calibration is essential, the focus chart should be mounted on a track or slider so fine adjustments can be made.

Step 3. Set the lens to the close focus distance and move the focus chart towards the camera until it is in sharp focus. Measure the distance from the focus chart to the camera image plane and enter it using the virtual scroll wheel.

Diopter Calibraton Step 1

Diopter Calibraton Step 2

Diopter Calibraton Step 3

Light Ranger 2 Offset Calibration for Diopters

To allow accurate measurement of distance close to the LR2, an IR reflective neutral density filter of 1.3 OD or greater must be placed over the LR2 receiving optic. This is to prevent overloading the LR2 receiving electronics and causing incorrect distance measurements. Note: ordinary neutral density filters meant for visible light will not work with the LR2.

The depth of field for a lens with a diopter set to its maximum iris opening may be as shallow as a few millimeters. The precision of LR2 measurement is at best ±1cm; other factors such as parallax and the 3-dimensionality of the subject further limit the accuracy of extreme close-up focus measurement. Therefore be prepared to use a deeper T-stop.

Preston Cinema Systems Part # 6030 – IR OD filter for the LR2M

Expander / Reducer / Extender (EXT)

The Extender Lens Function (EXT) adjusts the displayed focal length and T-stop when an extender or expander or reducer is attached to the lens. Enter the Extender Power using the virtual scroll wheel on the HU4 display. The range of diopter power is from 0.5 - 2.0.

Constant Zoom Speed (CZS)
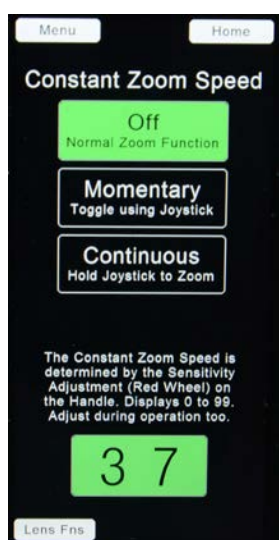
The desired zoom speed is set using the red force sensor on the HU4. You then start or stop the zoom by pressing the force sensor either momentarily (Momentary mode) or continuously (Continuous mode).

Firmware Version Report
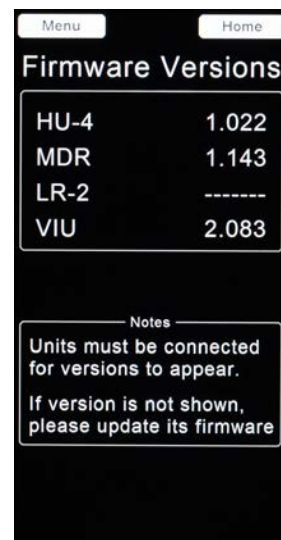
The System menu shows the HU4 and Transceiver firmware versions. Tap the Firmware touch area in the System Menu to show the Firmware Versions for all units present in the system. Firmware Versions prior to the latest releases of 11/2021 are shown as dashes.

Preston Diopter, Dolly-Zoom, Expander and More Updates

Dolly-Zoom Function (DZ)

The Dolly-Zoom function (DZ) keeps the image size constant while the distance from camera to subject changes. This is accomplished by linking the zoom focal length to the distance from subject to camera as measured by the LR2.

The lens entrance pupil to image plane offset may be entered manually or determined by calibration. Although the Dolly-Zoom doesn't require entering the entrance pupil to image plane offset, calibrating for the entrance pupil gives the most accurate result.

The greatest change of perspective from foreground to background corresponds to the largest change in the zoom focal lengths. This change can be maximized by first setting the subject size with the widest (minimum) focal length and the closest subject to camera distance, followed by the tightest (maximum) focal length and farthest subject to camera distance.

Setting Iris Limits

Iris limits are set as follows:

- (a) position the iris slider to the first limit
- (b) hold down the Iris Limit key
- (c) move the slider to the second limit
- (d) release the Iris Limit key.

The picture at far right shows the scale expanded from T4.0 to T11. To restore full scale, press the Iris Limit key for 3 seconds.
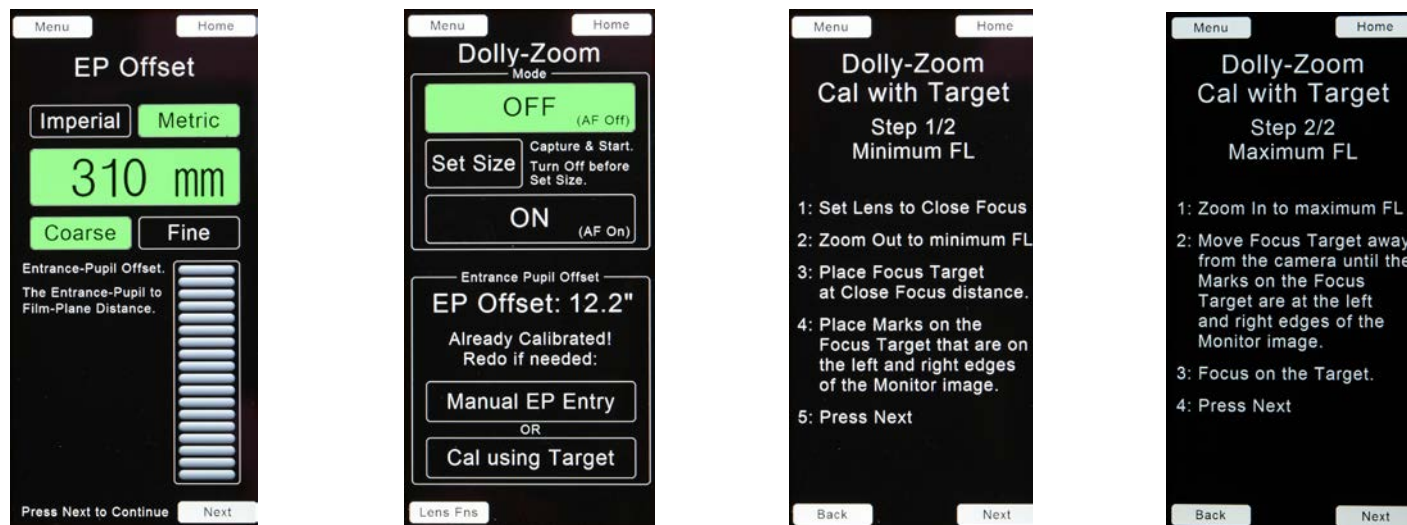

Iris Limit Button
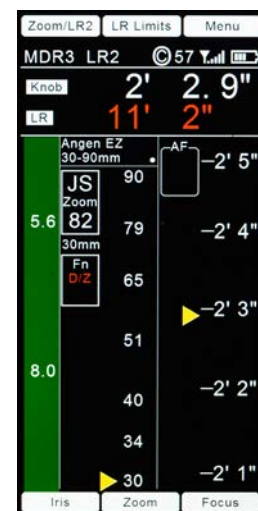
MDR-3 ver 1.143, MDR-4 ver 1.064, DXL ver 1.023

Firmware updates support new HU4 Lens Functions.

If the Bluetooth Module no longer displays the serial number when connecting to the phone app (and will not update firmware or transfer lenses):

- Power up MDR. Plug the Updater into the Serial port on the MDR-4 or into Serial 1 port on the MDR-3.
- Set the transceiver channel to 59.
- Hold the Cal button for 8 seconds. Release.
- Wait 10 seconds while the recovery process completes.
- Power down the MDR.

LR2 ver 2.000

Light Ranger 2 (all models) operation in heavy fog or smoke using the Defog function is greatly improved. The new algorithm removes false detections from fog particles close to the camera.

Video Interface Unit ver 2.084

New camera menu items added:
Sony VENICE 2 8K and ARRI Mini LF.

Contact

Preston Cinema Systems   *prestoncinema.com*

Loumasystems News

Montmartre rue Foyatier steps

Prepping the Newton Head with Alexa Mini LF

Spidercam 2D in action with control monitors in foreground

by Jean-Marie Lavalou

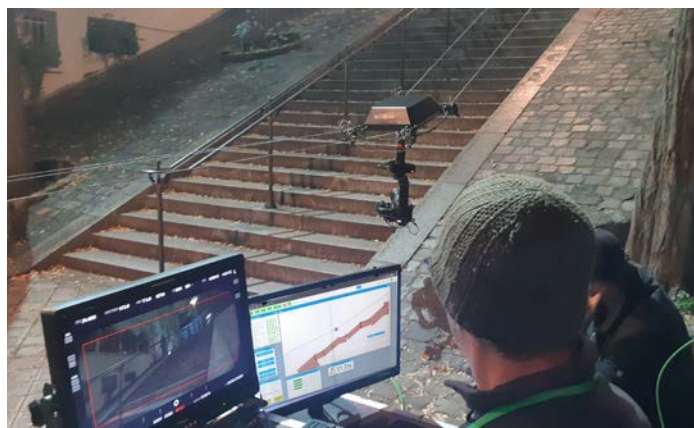## Loumasystems's Spidercam on *John Wick 4*

Loumasystems helped cover an impressive stunt in Paris on the upcoming *John Wick 4*, the fourth edition of this action-packed movie starring Keanu Reeves.

The director Chad Stahelski and cinematographer Dan Lausten ASC, DFF (*The Shape of Water, Crimson Peak, John Wick 3*) had a big challenge: how do you follow a stunt guy for nearly 50 meters while he is rolling and tumbling down (roulé-boulé) one of the steepest set of steps in Montmartre, Paris?

The stunt was too fast and too dangerous to be followed by a Steadicam operator and there was not enough space to use a telescopic crane. A drone was not an option because the director wanted the camera to be as close as possible to the action. Additionally, the director wanted the stunt to be covered in one continuous take without cuts.

An aerial cable system seemed to be a possible way to go. French key grip Pascal Delaunay called Loumasystems to explain the situation and they proposed the use of their Spidercam 2D.

The Spidercam is a new generation lightweight aerial cable system using high-tech technologies like Kevlar cables and embedded fiber optics to transfer data and video signals.

The Spidercams' default stabilized head is the Newton Head, but it also accepts other heads like the Arri SRH3 or the Shotover G1. Due to its lightweight design, it offers high performance, speed and acceleration—making it well adapted to action movies and especially to this stunt.

A little drawback is that its lightweight advantages go along with a relatively limited load capacity (a maximum of 25 kg for the remote head and camera package). This limitation has been the reason why, for a long time, the Spidercam was restricted to TV shows, concerts or sport events like soccer, rugby and tennis. For many years, features in need of cable systems have been using heavier systems with heavier stabilized heads and a much bigger load capacity.

But the emergence and now common use of lighter stabilized remote heads like the Ronin or the Newton Head and of cameras like RED or ALEXA Mini, along with more compact zooms, have accustomed cinematographers to accept and use smaller camera packages which are now light enough to be carried by the Spidercam system.

You might be losing the comfort of a full camera body with all the bells and whistles and possibly a big zoom, but you are gaining in weight and compactness. This allows you to be faster, more reactive, and closer to the action. Smaller camera packages and remote heads also mean fewer shadows and a better access of the light to your subject, all assets permitting you to place the camera at the core of the action, and … this was exactly what the director Chad Stahelski was looking for.

The Spidercam can be used in 2D or 3D mode. In 3D mode you are moving the camera in a volume. In 2D mode the camera is moving only inside a vertical plane (the camera moves only in one direction, but it can move up and down in this direction).

Loumasystems News

Spidercam "dolly" close up

Supertechno 75 at Le Louvre Marly arcades

Loumasystems ST30 at Musée d'Orsay

The 2D mode was more suitable for the Montmartre set given the narrow set of the steps.

2 hoisting cranes were placed at each end of the path of the camera for the attachment of the pulleys that were redirecting the cables towards the winding winches below. The Spidercam's high resistance Kevlar lines are positioned 2 feet from each other. Altogether, the Spidercam 2D system with its camera is working only in a narrow, 2-foot wide corridor—quite an achievement when you consider moving a camera in the middle and close to the action. The maximum speed can reach 9 meters per second with very "nervous" accelerations.

Dan Lausten used an ALEXA Mini LF and ARRI Signature primes. The stunt was very demanding for the stuntman (can you imagine the number of steps and impacts?) and a miss was out of question. The stunt and the shot were a total success on the first take and the director was very satisfied.

Nevertheless, to the surprise of everyone, the stuntman proposed a second take!

Among the modern tools allowing a camera to move in the middle of the action (Steadicams, telescopic cranes, Ronin and other gimbals, drones, etc.) the Spidercam has emerged as a new player, opening a lot of new possibilities in filmmaking when other systems encounter their limits. It is discreet, safe, silent, precise and very fast. It can start very low to the ground and go very high depending on the size of the hoisting cranes you are using.

It does widen the possibilities of the cinematographic language a great amount.

Loumasystems and Louis Vuitton Fashion Shows

Loumasystems supplied cranes on the last two Louis Vuitton Women's Collections Fashion shows. The Spring-Summer 2022 show was presented at Le Louvre Museum and the Fall-Winter show was at the Musée d'Orsay.

At Le Louvre, a Supertechno 75 was used to follow the models along the Marly arcades (see photo at left). The Supertechno 75 is the latest in the Supertechno range of telescopic cranes. It has a 62'8" telescopic range and can bring a camera to a height of 75 feet. It has its own stabilized head and the latest software assistance technology with trajectory compensation. It comes with a fully motorized dolly—a must for a crane of that size.

For the show at the Musée d'Orsay, the director used three Supertechno 30' and a Techno 22'. The shoot was a challenge as Orsay could not close the Museum especially for the show. The production could only shoot on their day-off (which is on Mondays). It meant that crews could only enter the museum on Sunday, the night before, once the public had left. And the show was being aired on Monday afternoon! That was very little time to bring all the gear, the lights, do the rehearsals, the show, and wrap everything all that within 30 hours or so.

Bringing all these big cranes in the middle of all the antique statues in the Musée d'Orsay on such a tight schedule, without the curators having a heart attack, required a lot of organization, high professionalism, and sangfroid. Everything went well and the Museum reopened on Tuesday morning as if nothing had happened.

L-R: Andrew and Ben Steele in the reception area of EMIT

Happy Anniversary. EMIT, along with other leading companies and studios of the French film industry, is centered in Saint-Denis, 5 miles north of Paris. The 2024 Olympic Village will be nearby. Presiding over EMIT in a modern, 40,000 square foot loft-like space are Andrew and Benjamin Steele. This is a special year for the company. Andrew and Ben discussed how and why.

Jon: This year marks the 40th Anniversary of EMIT. How have you seen the industry changing in the 10 past years?

EMIT: No doubt, this last decade was incredibly rich in evolution for our industry and it's amazing to see how much can change in a relative short period of time. Back in 2012, the cinema industry had already evolved from analog to digital times. But this decade certainly confirmed all the hopes we expected in these new technologies. For instance, digital cine cameras have rapidly become smaller, lighter, with more resolution and capable of storing more data. The image has gone bigger with Full Frame / Large Format sensors.

This gave a great opportunity to the cine industry to develop and come out with new equipment, applications and processes to accompany this evolution. New lenses covered the larger formats; some brought us new looks. There were new filters to control your image, more precise lens control systems or range finders to

keep the image in focus, more advanced post productions tools expedited the finishing process. All this convergence gave DPs and image-makers more creative choices, and in the end, great images.

What were the best selling products over this decade for you?

First of all, we would like to take this opportunity to thank all of our of suppliers who have been incredibly creative and worked very hard to develop new products to address customer demands.

If we had to make a list, there would be certainly the ARRI ALEXA Mini and Mini LF cameras, Cooke lenses and especially the Anamorphic/i Full Frame primes, Angénieux EZ Zooms, Rig from Betz, Sliders and Tripods from Ronford Baker. Essential products also include Tiffen Diffusion filters and Easyrigs that have been very popular all this time.

I remember a quote from someone named Andrew Steele saying, "We will sell things that fit on the camera, but not the camera itself." Now I see that you are a distributor for ARRI in France. What has made changed your mind?

That was more a legacy from our father Trevor who promised, when he founded EMIT in 1982 from the wreckage of Éclair, not to sell a camera again. It was not a quick decision to become an ARRI distributor. It may seem strange, since ARRI has

Showroom and sales areas

Andrew and Ben Steele in the service area

undoubtedly the most complete catalogue of high-end products in the industry and for that reason, we had to make sure that EMIT could match the same high level of stock, supply and service that our customers were used to with our other suppliers. We started in 2015 with the ALEXA Mini and recently Mini LF plus all the systems that ARRI provides around it such as WCU-4, LMB4x5, FSND Filters, etc.

I understand you also do rental now?

We always have done rentals but on a smaller scale. In the beginning, we started just with filters, matteboxes and a few special lenses like Superscopes, probes and macro lenses. Over the years, not only has the demand but also the choice of product dramatically increased, creating a chronic shortage of equipment. We mainly sub-rent to other rental houses, to be precise. We discuss with them what they are missing or not willing to invest. That helps them also to free some of their budget to buy something else we sell! Our rental department philosophy is to be complementary to our customers but never in competition. This is the reason why we rent everything around the cameras but not the camera.

Nowadays, we have a large choice of prime and zoom lenses including latest Cooke, ARRI, Angénieux and Leitz. We also rent lens control systems (cPro, Hi-5, Preston), Range Finders (Cinetape, Focus Bug, UDM, Light Ranger 2), all sizes of monitors and wireless video systems, etc. The funny thing is that initially this department was just to sort out customers with last minute urgencies, but we didn't expect it would become a daily activity.

Do you notice there are now more owner-operators buying equipment in France?

It's a real tendency. The main reasons are probably because crews have been so busy for the past 2 years in France, resulting in a shortage of equipment. In the past, our customers were mainly large rental houses and TV stations who only expected equipment stock and after-sales from us. Nowadays, we have more varied customers, including smaller rental houses, independents and owner-operators. One of the reasons to move to a bigger office in 2018 was to offer these customers a dedicated space where they

can test and put their hands on the desired equipment. For owner-operators, such investment is a big decision to make and we are there to give them all they need to make an informed choice.

In fact, this year we should start hosting events again in our office and launch very exciting new products in France. After 2 years of social distancing, we are looking forward to these convivial moments again where we share knowledge and experience from manufacturers to end-users and vice versa.

2032 will be the 50th anniversary. How do you see the future?

We are very optimistic for a bright future. Cooke announced new S8/i prime lenses recently, after launching two new Varotal/i FF zooms and Panchro/i Classic FF lenses as well. ARRI will launch their highly awaited new S35 4K camera. Other new and exciting products are coming from other suppliers like Betz, Easyrig, Flowcine, Panther and more.

What we've learned from the last 40 years is the importance of staying true to our values: offering high-end quality products to serve the creativity of image makers with reliability and good service. This is what defines us and has provided us with passion and success. We built and expanded our business by listening to our customers, our suppliers and our team to provide support for the industry. We believe in this approach and look forward to continuing the journey in the same direction.

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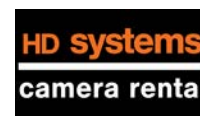soc.org

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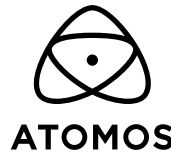
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