Jon Fauer, ASC www.fdtimes.com Sep-Oct 2023 Issue 122-123

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Art, Technique and Technology in Motion Picture Production Worldwide

FILM AND DIGITAL TIMES

Art, Technique and Technology

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Cover: Danny Schmidt carrying a new Sony BURANO camera with G Master long lens on a Cartoni Tripod on a National Geographic film in Zion National Park. Photo by Rachel Ross.

Prone to Risk. Bob Richardson, ASC on *AIR*

Robert Richardson, ASC. (L-R). Photo: Ana Carballosa. © Amazon Content Services LLC

Jon Fauer: Your habit of being first to shoot with new prototype cameras continues. AIR was the first feature that I know of to use the ALEXA 35. Pre-production models, of course.

Bob Richardson: When we heard about the ARRI ALEXA 35, I was instantly attracted to it. Not only was it receiving interesting reports from DITs I knew, but I was also doing research. I thought, "Okay, let's go see this." Ben Affleck and I went to test it for *AIR* and we just said, "This is beautiful. Let's try to get this camera." The added advantage of the ALEXA 35 camera was that it was Super35, not Large Format, so now it opened up a wide range of lensing.

The ALEXA 35 was introduced in June 2022 just as you began shooting AIR. You were pretty brave to shoot an entire feature with cameras that were still prototypes. Why did you do it?

It had a lot to do with Ben as well, because he also had to have faith in them.

Devil's advocate: why didn't you use just existing ALEXA Mini Super35 cameras?

Good question.

Maybe because they were not prototypes or the next new thing?

I'm prone to risk.

There you go. That could be the headline: "Prone to Risk."

Don't be afraid. There was another reason driving the ALEXA 35—having Super35 format lenses. Almost everybody was shooting Large Format at that time, which left me with too few choices. I would not have been able to get enough. I literally could not have put together an ALEXA LF or Mini LF camera and lens package.

Ben also appreciated the quantity of lenses we were getting from Panavision. We got all the lenses that didn't need to be Large Format. We had so many lenses. I think at one point we had 50 or 60 lenses in the room. We tested at Panavision: we looked at each one, recorded with them and discussed how we felt about them. And then we'd get Ben. He'd look through the camera and screen the tests. And then we'd make choices. Ben is super involved in that respect.

I assume you also tested ALEXA 35 against other cameras?

No, I didn't.

Oh, really? You just decided to be prone to risk and use the latest, untried camera?

Correct. I didn't have any hesitation. I did have some earlier conversations with people who had been testing the ALEXA 35 for ARRI. They spoke about range and color. I knew those people pretty well, so I was in pretty good shape to trust them. Once I started shooting with it, I knew what I was getting.

Sebastian Laffoux at ARRI showed us some tests, so I wasn't tre-

Director Ben Affleck and Robert Richardson, ASC on AIR (L-R). Photo: Ana Carballosa. © Amazon Content Services LLC

mendously worried about it. I'd already been down the road of prototypes on other movies. We got the original ALEXA when we started *Hugo*, with just two cameras.

And you were shooting stereo 3D on *Hugo*, so you needed both cameras in sync together.

Then I needed four. They provided us the next two. We found that for 3D we had to have two rigs, because it was too slow to change the rig. Marty Scorcese knew what he wanted for his next lens setup, so we would generally build that rig while we were shooting with the current setup.

It's interesting that we're talking about Super35 on *AIR*, and for the last FDTimes cover story discussion you and I had, you were using an even larger format camera, the 65mm ALEXA 65.

Yes, I love the ALEXA 65. I think it truly has some of the best flesh tones. I also enjoyed the ALEXA LF, but as I mentioned, there were very few lenses available at the time to rent for AIR because it was so busy last year, and I was doing back-to-back shows. On AIR, we anticipated needing three bodies and lots of lenses. And so, I was able to get a large and great selection of lenses. Dan Sasaki at Panavision made us some lenses that they called "RRs," (Robert Richardsons) which the Focus Pullers called "Widow Makers" because they opened to T1.1.

Your Focus Pullers must have loved you for that.

I didn't have to go there very often because it just wasn't necessary. We went through a lot of different lenses on AIR. On *The Equalizer 3*, which I did with Antoine Fuqua after *AIR*, we used even more lenses on our ALEXA 35 cameras. I had old ZEISS lenses, including Super Speeds. I tried to hunt down lenses like that—trying to keep in the vintage range because I find that vintage lenses have proven to be an advantage for me with digital in terms of softening the overall image to some extent.

On *AIR*, Dan Sasaki created a series of additional lenses or filters to put on the front of the lens. I had one that was basically called a dirty lens, a dirty filter. The aberrations weren't predictable. How you moved it would alter the look. We had a lens that could force somebody into a thinner perspective, or if you rotated it, you'd go wider. Sometimes that worked, sometimes that didn't work, and sometimes I didn't have enough of them to be able to cross over all cameras and match all the lenses.

We had filters on the front for *AIR*, but if you stacked them too much, you would get fringing. So we had to cut back. I had three different types. If Ben or I wanted to go wider, then we would end up with probably one or two. But we would also play a bit to change the image shape. If it was a single shot of Ben, we would rotate the filter a little to make it thinner. And when shooting Matt, he'd get a little turn of the filter to make him look heavier.

The filter shifts the image, so it goes wider and higher. It has also an added element that gives you a bit of...I want to say grit, but

Photo: Ana Carballosa. © Amazon Content Services LLC

it lowers the contrast. So, when we had another lens that wasn't quite dirty enough, we kept making it dirtier and dirtier, meaning I wanted to feel the effect of that filter when we put it on.

Was it like an anamorphic cylinder?

It is like an anamorphic cylinder to some extent. And you could get slightly different colors out of it. I didn't get to do a lot of that on AIR because we just didn't have to. The lighting was less aggressive than on *The Equalizer 3*.

By the way, I just saw a test that ARRI did with their negative and positive diopters (Impression V filters) behind the Signature Primes. I thought that was very interesting. But they weren't available at the time.

Ben talked about using his Angénieux Ultra Compact on his RED V-RAPTOR 8K VV. Did you have zooms as well?

We had a number of handheld zooms. Almost all the lenses [except the Angénieux Zoom] for *AIR* came out of Panavision.

And the camera?

We were the first feature film with ALEXA 35. Chivo was shooting a television series with Alejandro in London and elsewhere. He was quite enthusiastic about the camera. He talked about trying to push it to 2,500 and using one of the internal Looks or Textures. I did not go that route, after doing tests, because I found that we could pretty well create it ourselves. Colorist Élodie Ichter of Picture Shop was grading on set with us.

When we filled up a data card, it was handed over to her and she was grading simultaneously with us. I'd try to break for lunch or whenever to catch up and view scenes with her. Then she would pass it on to editorial, which was right next door. Every day, Ben would go into editorial and start cutting the film. He would also come in and sit down with Élodie as she was grading. He has an extraordinarily sharp eye.

Did you establish a look in advance?

Yes, we did. Ben wanted a very period feel. But that didn't work out. It was too aggressive and I wasn't fond of what it was doing to the color. We watched dailies, Ben would weigh in, and then we'd start to alter it even more. Then Élodie made a lookup table and that became the show LUT, the basis of the look of the film.

Did you load that LUT into the camera?

All the LUTs were loaded into the camera and worked quite well.

Was that your base exposure on AIR?

800 ISO. Except for when I had to go outside. I also had a special ND filter that screwed onto the eyepiece, because it was too bright. I find that most eyepieces are just too bright and you cannot dim them down enough.

What attracted you to this particular camera, ALEXA 35?

First of all, I like the 35mm format. The ALEXA 35 has good resolution. It's very comfortable to use. It rests on my shoulder with extreme ease.

Colin Anderson was our Steadicam and Camera Operator. We also did a lot of remote head work that could move the camera on a dolly almost like a Steadicam. It was extraordinarily stable. Because, if you're going to stop and have a Steadicam hold the framing for two minutes or more, and you're going to do X number of takes, that's when you ask the Steadicam Operator, "Do you feel comfortable?" There were a couple of times when we sat for three minutes and that's a lot to ask of an Operator, especially if you do it all the time, all day long.

And so, by having the camera on the remote head, I was able to get a much more locked down image once I found the shot and not have to worry about it. In other scenes, I really needed the flexibility that I wouldn't have been able to get riding on a dolly, but could with the remote head attached to that dolly. We also had a remote head on a small crane for a number of shots indoors and a large crane outside.

Why did you have a remote head on the dolly rather than having you ride and operate directly on the dolly?

Because I didn't need to lay a floor. It was a stabilized remote head. That offers you quite a savings in setup time when you're doing a 60 or 70 foot move and you're not laying down a floor for it. That makes a big difference. When we did 360-degree moves or things like that, I'd ride the camera on dolly track. But initially we worked mostly with the stabilized remote head.

Saving time on set...

Yes. Recently, a DP friend said, "If you depend upon a DI to save time and resolve certain situations, they say you don't know how to light." I don't agree with that assessment. Yes, it's important to know how to light and many people don't. But sometimes you might be confronted by a huge wall that's way too hot. In three minutes I can take that wall down in my Digital Intermediate or spend an hour, or an hour and a half, cutting the light off that wall or taking bounce off the floor.

Digital is so sensitive today in terms of speed that it's often about negative fill to reduce the light sources and not to be adding light. The attitude on AIR was to work mostly with that sensibility. We had LEDs wired in the ceilings overhead and we could shift the tonality and the brightness of those LEDs depending upon the scene.

As mentioned, after *AIR*, I went on to do *The Equalizer 3* in Italy:

Rome, Naples and the Amalfi Coast. Naples was fascinating because, as Antoine would say, "Naples is what New York City used to be." By that point I knew the ALEXA 35 quite well and did a lot more playing with exposures, under exposure, over exposure. The story could afford to be more stylistic. I pushed it to a very high degree.

You often push cameras to a high degree: an ALEXA 65 prototype on *Breathe* and ALEXA prototypes on *Hugo*.

All the cameras on *Hugo* were still works in progress. Things were experimental: paired cameras, shooting 3D. The engineers were constantly saying, "Well, we have to fix this, retrofit that." And I'd say, "Okay. Just don't tell me what you're doing, and don't move the camera."

Was *AIR* also a camera science experiment? When did you start shooting?

June 2022. It was no experiment. The cameras were in great shape. It was a 28-day shoot in 2022. I think it was scheduled for 32.

The ALEXA 35 camera was officially introduced in June 2022.

Initially when we only had two ALEXA 35 prototypes, Ben would use his RED V-RAPTOR. Sometimes he'd get the ALEXA LF. Then we got a third prototype ALEXA 35, and eventually Ben bought his own.

With our three ALEXA 35 cameras, we always kept one on the stabilized head or on the Steadicam if we knew we were going there. Then the other two would be for A and B camera if we were on dollies or tripod or handheld or whatever it might be.

Did you have ARRI staff and engineers on set tweaking away or preparing things?

Whatever was done behind the scenes, I asked not to be told these things. I didn't want to be worried. If I knew, I might have been worried. I was always worried on "Hugo". But, we had no problems. They were there if there was any issue, if they were making any software changes, updates were being loaded into our cameras. I was never in a position where we didn't have what I needed.

People would come. Jimmy Ward was First Assistant. He knows that I don't want to know. If he has a problem, he'll just say, "We're going to take the B camera right now. Something's happening. We'll do a little change on the A." And I'll be like, "Okay." That's what we do. We had a backup ALEXA Mini LF, so we knew one way or another, we'd get to where we needed to go.

Were you shooting multiple cameras simultaneously?

Yes, there were a lot of multiple setups. For example, we had four cameras covering the sequence with Viola when they're showing the sneaker for the first time in the boardroom.

Do you still operate a camera?

Yes. Usually the A camera. I was using a zoom lens, so I could grab things in between as much as I could. All of us were using zooms because it allowed more flexibility because the room was so small. It was not a set. This was basically a real location that was turned into a location studio—one big bullpen with Ben's office upstairs.

Where was that? Portland?

No, it was all in Santa Monica. Rob Legato went up north to the actual Nike headquarters and shot material there to tie in. Some of the Nike interiors with Matt were done on stage with LED walls and green screen. And there are some shots that I assume Ben and Matt may have gone off and done. Because Ben has no fear about shooting.

In the interview we did last month, Ben said, "I'm nowhere as near as skilled an Operator or even remotely coming close to Bob. But I tried anyway." He seems like a fellow equipment aficionado.

Ben is extraordinarily bright technically. Not only cameras and lenses, he is also remarkable on DaVinci Resolve. The man takes it very seriously. He was very much a part of setting all the looks. In the end, when I was over in Italy on "Equalizer," he completed the grading on Baselight that I had started with Élodie.

We used DaVinci Resolve on *The Equalizer 3*. It's really up to the colorist. Rob Legato is also a big fan of Resolve, which was great because I have worked quite a bit with him.

The color science on the ALEXA 35 is different from what came before. Did you find that pretty seamless or was there a learning curve?

I think it has an incredible range on the top end. If you watch the trailer for *The Equalizer 3,* the first shot is a black door opening. And there's Denzel in the middle with one 18K coming through a window. That's all the light we have for the scene. But I was able to pull down the window to see the light. It had to be 16 or 17 stops over-exposed. Therefore, you have to be wary of what you have outside, because anyone can pull that back later in post. And if you don't want it in, you have to be very careful.

I think that maybe the ALEXA 35 doesn't reach quite as far down into the shadows as it does way up in the highlights. It's very good. I'm happy with it.

In terms of style, *AIR* seemed different from what you normally do.

Very much so. It was flowing well with what Ben wanted. I didn't want the cinematography to take over what was a remarkable cast. They were performing at a very, very high level. I think it's an amazingly strong film. Ben did a brilliant job. So did Matt, Tucker, Viola, Bateman, Messina, Wayans. And Matthew Maher, who played the developer of the shoe. Come on. It's an incredible group of people. Everybody had such a positive, professional attitude. It was a true pleasure. When I did *A Private War* and *Adrift*, it was very much the same thing. Nobody ever left the set; they were always there.

Was the studio in LA?

It was not a studio. It was literally a corporate building with two vacant floors in a large group of buildings near Pico. We had to replace all the existing overhead fluorescent lights, which were hideous.

Your Electric and Grip crews must have loved you for that.

Nothing phases our Gaffer, Ian Kincaid. Nor does anything phase Key Grip Chris Centrella.

How did you control the overheads?

He basically had them controlled by iPad or a large dimmer board.

Photo: Ana Carballosa. © Amazon Content Services LLC

Ben Affleck talked about doing pickup shots.

He calls them that.

And what would you call them?

Ben did a lot of pickup shots. But he also did the first sequence in the bar when Sonny (Matt Damon) is talking with George Raveling (Marlon Wayans). And there's a very odd focus pull that happened.

He's handheld and pulling focus himself on the person who's listening.

Yes. And I got blamed for that by some reviewer who said, "Richardson and his surveillance camera technique."

That's unfair. It was documentary style and appropriate.

Yes, and it's in the style of period footage that we were using, including some really old, bad video cameras, Super8 and pushed 16mm film. Some of that material starts the movie and that's mostly his work.

Ben's focus got better and better as he went along. We also got him an assistant. At a certain point you ask, "Hey, can I get you somebody, so they have the camera at least ready for you?" It would be a Second Assistant or whatever, but always have the camera prepared. Here it is. What do you want? And having an assistant gave him more options.

Ben talked about operating a camera himself. He said, "I thought it was an interesting compliment to the beauty of what Bob does. He can't help but be masterful. I hate to say it, but a little touch of my much less skilled operating in a small way sometimes adds flavor to the film. I would never be an A or B camera operator because I can't really compose properly, so I couldn't be relied on to do that."

And yet, that lack of "reliability" works because it could have been documentary footage from that time.

When I heard the criticism about surveillance, it was really low. I felt okay, I'm going to take that hit. But, Ben said, "It was the only way for me to get at the performance." You don't argue with that.

In fact, he explained that in his interview, "There was some rack focusing in there. As an actor, I often find myself actually liking my off-camera work a little bit better because I'm more relaxed. I filmed both Matt and Marlon during the other person's close-up. It was essentially having them in the foreground—not a close-up single, but pulling to them from the foreground. Often, there's something about the relaxation that you feel when you just don't think you're on camera. It actually gets a little bit looser, sometimes a little ad lib.

"It means that you can get in interesting places. And it really becomes about composition in a lot of ways. I wouldn't shoot something where Bob doesn't agree. I always say to Bob, 'Anything that I get, if you don't like it, you can throw it away. I am not the cinematographer; you are by a whole long way.' Bob is one of the greatest ever. It's a real honor that he kind of tolerated my additional shooting.

"Having those moments of performance, 'caught moments,' or getting over Matt's arm and shoulder, just makes it feel a little bit less like a movie to me. It's kind of half captured and thrown away. I feel that it adds to the authenticity. Not all movies can absorb that."

We'd have two cameras going from the same direction, and Ben would fit in where he could to get the shot.

He said this about that, "Bob sets up two cameras. Obviously, he's brilliant. He's a genius. He finds where the shots should be. So inherently, by necessity, I have to be somewhere that you wouldn't normally put a camera. Then I have to compose, within that space, a different kind of shot than you would typically see. I like to go handheld. Sometimes I'm racking focus, documentary style. I pull focus myself."

It's true. But the thing about him is that he just loves shooting. There's a love and enthusiasm that comes from him. I remember I saw him the first day doing some weird handheld shots. And I said, "Well, let's get him a tripod." He didn't want it on a tripod. Then finally, I think we ended up getting him a dolly and he could put the camera on a bag if he wanted.

Quentin Tarantino will shoot periodically as well. Who am I to say to these Directors, "You can't do this?" Especially when they do it with a big smile.

Ben was very cool about all that. And then there were other times when he would sit back, totally absorbed in watching the monitors. He was not operating a camera. He was extraordinarily focused on the acting and performances in this movie. To be able to put a movie like *AIR* together that fast with that sharp a brain and have everybody on board with him, I think, was amazing.

This was not the first time you worked with Ben Affleck. You did *Live by Night* together.

That was with the ARRI ALEXA 65.

At the outset of *AIR*, did you discuss style and say it's going to be documentary style or another style?

No, the style evolved out of how to shoot the scene and get as much as possible from it. Because we were moving so rapidly, sometimes it took on a bit of that docu feel where you have a zoom and you're able to recompose. I tend to shut my camera off when I do a zoom and then it's back on when I've got it. I don't

like it when somebody uses the zoom, unless you're going to do the zoom for a particular reason. But they leave in the zoom when you are recomposing, then it just feels like sloppy filmmaking. And we weren't going for sloppy filmmaking.

It wasn't sloppy. It was controlled.

It was all about the acting. It's making sure we capture the eyes. You need to see the eyes.

If most of the lighting was overhead, did you have to fill to see the eyes?

No, I had so many of those overheads that they would fill it in as you move, for example, when he's sitting at his desk and the camera's doing a 360 around him. Or he is sitting at another desk in his office, I would light with practical lights as opposed to working off the top light.

Like the scene where Matt says "The Dalai Lama doesn't have a Porsche."

"...a purple Porsche."

That was in his office. Ben's lying down, flat on a couch, lit by the overheads. I could have come through the windows sometimes, but it didn't work very well because it was on the third floor and you would have seen a Condor crane outside. For that particular situation, I did a combination of overheads and LEDs pulled off the walls.

Getting back to being prone to risk—how did you even manage to find accessories for your three brand-new prototype cameras? Did they even have baseplates at the time?

ARRI was very helpful and Jimmy was rather remarkable coming up with solutions to things that didn't exist. There were a fair amount of ARRI accessories, but not for every camera. Jimmy had things built, Dan would help, or somebody in machining at Panavision would make something until ARRI had it ready. But overall, I would say ARRI had everything relatively soon after we started shooting.

Leading question: please discuss light meters and monitors.

I find that there's a substantial shift in the methodology by which Directors of Photography shoot today. It's constantly looking at the monitor and very little metering. But, I'm absolutely the opposite. I do use a high-quality monitor and it is the same model that we have in the grading room, so it's perfectly matched. Ben also has one on set. But I still use a light meter because I find that I don't necessarily always agree with what the monitor is showing, especially as to the ISO (or ASA) sensitivity. Often, I would find myself almost stop off if I relied only on the monitor.

What light meter are you using?

I use a Spectra.

Do they still make Spectra lightmeters?

I bought four of them on eBay. And then I have a Minolta Spot Meter. But my advice is for people to use whatever they like or can find. Just use it. Walk around and get used to taking readings.

I think it's so important because you can walk into a set when you're location scouting. You get a general reading of what the natural incandescents or available lights are because you don't have your camera with you. That gives you a basis of thought pattern to go like, "Oh, this one's going to be very difficult if it gets overcast, if we have to close the windows, if I can't look out the windows, if they drape them." Then you have a point of view to talk to production design.

I cannot help but tell people they really should learn how to use light meters. Your meters are vital to you. Let's say you're walking and adjusting the T-stop. For example, we had a long Steadicam shot on *The Equalizer 3* and the light was going from a T16 to a T2.8. How do you pull that, if you don't know what your exposures are based on a light meter? You have to walk it and get to see it. The windows were actually changing the quality of light based upon the conditions outside. You have to be prepared for it. Unfortunately, you can only do so much work in DI, but if you can't get close to where you need to be, you're in trouble.

Also, on *The Equalizer 3* we were in big houses with thick stone walls in Italy. There were times when the video signal couldn't get through those stone walls. All I would do was to follow the Steadicam with a little handheld monitor and a meter in my other hand. I'd just pull a stop based upon my meter reading and what I'd remembered I had prior.

Do you have a wireless lens control when you're pulling iris?

Yes. It's a Preston, but it's just with Iris control. I couldn't get that far away in the Italian villa, so we had to find ways of hiding in the shot. Jimmy, pulling focus, also had to hide, along with sound, so it was quite the cluster.

That was on *The Equalizer 3.* On *AIR*, we had more open spaces. I should also mention that I also insisted on having Teradek Bolt 4K wireless video transmitters and receivers. I wanted the highest quality image I could get on our 4K monitors.

Many people don't want to do that because they have to spend more on rental. At first, Ben was a little hesitant, saying, "I'm not so sure we should be spending that kind of money." But once he saw it, without hesitation, it was like, "Yes."

It's a very good decision to transmit and monitor in 4K because you can see things you cannot otherwise see. With 2K, you're getting fuzzy images and it is difficult to check focus. With 4K video, you can see those sparkles in an eye.

The Bolt 4K wireless video system is definitely worth it. When you're going very fast, you don't have a chance to go back many times. If you did, you wouldn't be going so fast. And then Ben would have to decide whether to go for another take if I happen to see that the focus has buzzed." Not that Jimmy Ward, our Focus Puller would ever be out of focus!

Jimmy rarely ever missed. He's that good. But it does happen that somebody just buzzes focus a little. And Ben's very specific. He doesn't really want those focus buzzes unless he intentionally puts them in himself.

What 4K monitors did you have on set?

Big ones, like 65 inches. A lot of people want to work with the small ones. They are easy for mobility, but not easy to see. No one liked me having these big monitors because they have to wheel these big things into a room so I can look at the image. Ben has his own big monitor and then the producers have one as well. It's an ordeal, but you get to see the film as a film. You see how it'll

Photo: Ana Carballosa. © Amazon Content Services LLC

come out and it's not sloppy.

Does Jimmy Ward use bigger monitors for focus as well?

No. He has a small monitor, with all these little boxes going up and down on the display.

Oh, the video overlay bars from the Preston Light Ranger.

Yes.

Where do you think things are heading for you in terms of formats? You've done everything from Ultra Panavision to ALEXA 65, ALEXA LF, and now ALEXA 35.

It depends on the picture.

And where are lenses going? More pristine or still distressed?

I think what you have in the ARRI Signature Primes are very pristine lenses that you can now mess up from behind to give it a vintage feel. You can add positive or negative diopters in the back. There'll be other options coming up soon.

For example, Tiffen's newly introduced filters—including Black Fog, Night Fog, Pro-Mist, Pearlescent, Satin, Smoque, Glimmerglass and more—to attach to the back of Signature Primes and Zooms, using the same magnetic rings?

I have to believe that we've been on the front of our lenses for too long. I never thought I'd get back behind the lenses.

You have used behind the lens filters?

Well, yes. When you do nets. All the nets run in the back. But now you can have glass filters in back.

Back to Ben Affleck. When he first showed up on set and he's shooting handheld with his camera, were you expecting that?

Yes, I expected it. When I did a small piece with Jennifer Lopez and Ben, he had his camera everywhere.

And then on *AIR*, it was like, "Okay, it's going to be the same. Here we go." And I welcomed it—it keeps him in the best state of mind.

That's a very nice attitude.

That's what's the most important. I just think that it helps the film work so well. He made a very fine film. We don't get these kind of films that often anymore.

Well-thought-out, good dialogue, good acting, great cinematography. It had everything.

For me, *AIR* reminded me of when I shot *Wag the Dog* and *Once Upon a Time in Hollywood*. These films have very good dialogue, great actors, good situations. We don't get those too often.

I'm sure there will be more. This "prone to risk" discussion has been super interesting. Thanks so much for your time.

Pleasure's mine.

Photo: Ana Carballosa. © Amazon Content Services LLC

Jon: That's you pulling focus in the photo behind Ben Affleck amid a sea of SmallHD monitors?

Jimmy Ward: I own a lot of camera equipment from Creative Solutions—wireless video from Teradek and lots of monitors from SmallHD. I think I had the Teradek Bolt 4K system on *AIR*, but I recently upgraded to a Bolt 6 system. I've known Greg Smokler for quite some time and we talk whenever there are new products for me and I like to give user feedback and suggestions.

On *AIR*, it was the first time that we decided to go all 4K resolution, which is not done extensively at the moment, particularly on the VTR side. A lot of things are starting to be 4K resolution, like the monitors, which are great, but every piece in the pipeline has to deal with 4K, and that's a bit of a stumbling block.

Bob also has a 65-inch 4K monitor on set which is like watching in a movie theater. So, during prep, we made the decision to try and make the whole workflow 4K. Willow Jenkins was the VTR operator, and they worked through the night for a few days before we started shooting to make sure that their QTAKE equipment could deal with 4K, and also 4K multiple cameras.

Bob often tends to shoot single camera, but we had quite a tight schedule. Ben likes to shoot quite quickly, so in order to capture the performances, and this a very performance-led movie, we would shoot two, three, occasionally four cameras at a time. So we were dealing with 4K playback and 4K monitors, and it all went very, very well. I think they appreciated that ability to see closer to what you would see at home on your home cinema system or in a movie theater live on set and make those judgements about whether they had the performance or the take. So yeah, it was tricky from a technical point of view, but it worked and we've pushed to continue viewing in 4K on other movies.

In his interview, Bob said, "Jimmy has a small monitor, with all these little boxes going up and down on the display."

I use a Cine 13" 4K High Bright Monitor from SmallHD for focus. And Bob is referring to the Preston Light Ranger system that I and a lot of focus pullers use. It has superseded almost everything else. There's a lot more accuracy now with these systems because, rather than measuring one thing in the frame, it can measure up to 16. It's a tool you have to learn. It reads different areas across a plane and gives information about distance. Ana analogy might be the backup system in your car where it reads an area across the frame. You have to interpret what that information means, and it's an invaluable tool now for how we work.

The traditional filmmaking process was a little slower. We would set things up, we would rehearse. Sometimes that still happens now. But a lot of directors now want to be able to throw a camera in and be able to shoot quickly and react to things, and getting a tape measure out and taking marks is not necessarily welcome anymore. I think you have to embrace the technology that allows you to work the way that a director wants, and be able to move quickly and get performances.

I've been using the Light Ranger since it came out and I consider it an essential tool for how I do my job. The combination of great image quality on the monitor and my understanding of the Light Ranger allows me to do the job that Bob and others expect.

On *AIR*, we were using a lot of custom-made elements that Dan Sasaki at Panavision had built for Bob to create different effects to detune the edges or to create flares. Rather than committing to sets of lenses with those effects built-in, he built a modular system so that, shot-by-shot, we could pick what we wanted. But often those elements would change how the focus scales would work.

I had to prep on the projector bench at Panavision to try and re-scale each prime lens depending on what elements were being used. There were maybe two that were almost like diopters, and they would throw the scaling way off. So I calibrated the Preston Hand Unit focus scale on the bench for each lens with each of the two options for those diopter-like elements so that, when we were actually shooting, you could calibrate it once, tell the Preston which attachment you were using, and then it'd automatically map the changes. And then the Light Ranger would still work with the new measurements that you were looking at on your monitor.

I would often have my monitor fed with both a 2K and a 4K image and then you would toggle. If you decided the Light Ranger wasn't giving you anything useful and what you wanted was just absolute clarity 4K image, press a button and you would switch from the Light Ranger display and you'd just get a clean 4K feed.

I have all three of the Light Ranger sensors: the original long range, the M and the wide. I do change them frequently. On zooms, which Bob uses a lot, you have to pick what you think is going to be more useful. But on prime lenses, you figure out generally what lens is more helpful for what.

But there are scenarios where, if you're trying to shoot through fog or glass, that sometimes having the longer Light Ranger punches through things a little bit better. There's a decision to be made not only about the lens you are on, but also what you're trying to achieve. Sometimes you just have an understanding that you're shooting a point of view through a car window, and the wide sensor is going to get too distracted by what's going on in the car. So you would want to go for longer sensor to try to read objects that are on the outside of the window.

Natalie Carr (below left), DIT, talks about AIR*:*

"Working with Bob and Ben is a fascinating experience. They both are very technical, so they expect their crew to perform on an extremely high level. They both like to use the new technology and they're not afraid of any challenges.

"We were the first feature film in the US to shoot on the brand-new ALEXA 35 before it was released to the public. We spent a lot of time testing the camera's new color space and bigger dynamic range to know how it would affect the lighting and exposures.

"Also, Bob and Ben decided to monitor everything in 4K. So, I had to make sure my equipment would be ready to process 4K signal and distribute it down the line to VTR and director's monitors. Bob wants the image on set to look as close as possible to the final look of the movie. He prefers to not use on-set color grading. He paints with lighting, and he is very meticulous with his glass and exposure choices.

"Bob created a show LUT with his colorist Elodie specifically for this movie. I used Livegrade and IS-Mini 4K color boxes to make sure everyone would get a color-accurate picture on set that would represent the cinematographer's look the best.

"Bob used his light meter to measure exposure on every camera set up. We used Preston single channel units to control exposure remotely. I used three calibrated 4K Small HD 22" OLED monitors on my DIT cart to be able to view high quality images for critical color and lighting control.

"Bob wanted to view the images on a larger 4K monitor so we had a calibrated 65" LG OLED monitor for him on set.

"I would control all the monitor inputs and outputs from my DIT cart using an AJA KUMO 12G router. It was very easy and convenient for Bob to see any 4K image from any camera or VTR's return signal on his big monitor or my DIT monitors to easily match the lighting. It helped us move very quickly and very efficiently."

Virginie Verrier, Director of *Marinette*

Virginie Verrier on another film in Montpellier, France.

Marinette *is a 2023 French real-life biopic written, produced and directed by Virginie Verrier.*

Garance Marillier stars as Marinette Pichon, the first French female soccer player to join the American professional league. She then held the women's record for number of goals per game on the French national team. The film is based on Pichon's 2018 autobiography "Ne jamais rien lâcher." *It opened in France on June 7, 2023 and at the Tribeca Film Festival.*

François Forestier of L'Obs (formerly Le Nouvel Observateur) wrote, "The power of the film comes from the contrast between the abject conditions Pichon experienced at home and her dazzling professional success within an industry dominated by men. Garance Marillier gives the film an electric charge"

Fabien Lemercier writes in Cineuropa: "Virginie Verrier has opted for fast-paced narration whilst achieving a perfect balance between exploring the character's private life and her sports career. The director [keeps}...the camera glued on her protagonist who's brilliantly played by Garance Marillier. It all makes for a fascinating film, paying fully deserved tribute to an exceptional woman."

Jon: How did you get started in film?

Virginie: I always did that. Since high school, I found a way to find some money to shoot films. I studied cinema and literature at the Conservatoire libre du cinéma français (CLCF) in Paris. After university, I began work as an AD, assistant director. Shortly after that, I shot my own short movie and did a lot of TV work. From the beginning, I also produced at the same time.

How did the film Marinette begin for you? When did you get the idea and how did it evolve?

It was five years ago. I wanted to speak about women's sports because I did a lot of sports as a teenager, especially track and field. That was very important in my life. It was very important for me to share all the sensations, all the ways in which those experiences built me into an adult. So, that is how I started. I also love biographies and biopics about real people. I read many books, looking for some character who might be interesting as the subject of a film. It turned out to be rather difficult to find a French woman who was a major figure in sports. There never had been a biopic about a famous sportswoman in France or even in Europe.

One day, a friend asked me, "Do you know Marinette Pichon?" And I said, "No. Who is she?" She replied, "You have to read her biography, *Ne jamais rien lâcher*." I read it and I realized that the story about her is compelling. It's huge. I decided to buy the rights to her book immediately. Two days later, I met Marinette at a restaurant and she said, "Okay. If somebody has to direct a film about my life, it will be you."

I met some producers and they said, "No. Nobody loves women soccer players in France." After two or three meetings, I thought, "Okay, I'll produce myself," as I did with my first movie. However, this one would be a very big movie. I realized that I would need many millions to do this movie. But I found the financing.

You financed the film yourself?

Yes. Soon after, I had distribution agreements with Canal+ and France TV because those channels, in fact, like the kind of story about a character like Marinette. It's something l'air du temps, fashionable at the moment. It was a good time to propose this kind of story in France and maybe around the world. It was cool. So, I found the 5.5 millions even though it wasn't enough. But we

had to do it.

Are you handling distribution yourself?

No. Only producing, writing, and directing. We presented the movie at Tribeca Film Festival.

How did you find Xavier Dolléans, your DP?

I've known him since 2016. He shot some scenes for the ending of my first movie, *À 2 heures de Paris (Two Hours From Paris)*. It's a road trip film and I needed some moving shots and landscapes. He spent a week shooting with me.

Xavier told me, "We did a lot of tests with anamorphic lenses because Virginie, the director, wanted to shoot anamorphic, but she also wanted to have a very discreet look. Not too much distortion, not too much flare, but still the anamorphic look for closeups." Could you explain what he meant by that?

Yes, because I love the style of anamorphic, but I do not like the deformations, the distortions. The grand style of classic anamorphic can be too much. I wanted something more... how would you say...discreet. I liked a vintage and charming look, with the touch of anamorphic. Just what he said. It's true.

How did you decide on the style, the look, of the film?

We did a "do not" list. Because I prefer to say what I don't love. After that, the doors are open. I don't want flare. I don't want anamorphic distortion. We did a list together. That's a good way to work together. It's difficult for me to make a mood board using other movies or photographs. That's not my thing, in fact, a "classic" look book. But of course, I share my influences

So instead of a look book, it's a "do not look book."

Exactly. At first, Xavier was crazy about this method, but after a while, he said, "Okay."

How did you and Xavier decide on cameras and lenses to achieve that "do not look?"

It was Xavier's choice. He loves working with VENICE. I was more specific on deciding the choice of lenses.

Please tell us about the VFX work in the film.

The camera crew had the Blackmagic ready all the time on the set, and Laurent Larapidie, the VFX supervisor, was able to use it to shoot all the VFX backgrounds. It was mostly used for crowd duplication by MPC. We had 70 extras in the seats at the stadiums, but of course, it had to look as if these places looked full, obviously. The VFX supervisor liked to work with a high resolution camera. Laurent was very independent with this Blackmagic camera. He often worked alone with the extras in stadium and he did his "shopping" with the camera. It was the first time he had that luxury, he said.

We also used that camera for some moments after the crew had finished and I saw sunshine or something interesting. Then, I would say to Xavier, "Okay, let's take the camera and go together to shoot some landscapes."

I understand the VFX work was intense because you were always moving, there were no tracking points, and many scenes had to be rotoscoped frame by frame. Isn't that very expensive?

Indeed, yes. Very expensive. Too expensive for the producer.

Did you know that going in?

At the end of the editing, they said to me that the cost was still too high, even though I had divided the number of shots by 2. The VFX was more complicated than the studio thought. There is a scene that lasts four minutes with a crowd made larger by VFX. It is very beautiful. It's a success.

Was the VFX made more complicated because of the wide shots?

Virginie:

No, more difficult was the hair of the soccer players. Those shots had to be rotoscoped, frame by frame. They proposed something cheaper—for example, to stop rotoscoping above the players' shoulders—which would have meant that the upper sections of the stadium would appear empty. But no, that was not acceptable. These are female players in the stadium, so there is a lot of hair. Therefore, rotoscoping took a long time. I wanted a full stadium. When Marinette is in the US, it was very important for me that the stadium was full. Empty in France and full in the US. When she

Actress Garance Marillier as Marinette (#11) playing with AGITO camera dolly. Photo by Guillaume Bouqueau, VIGO FILMS

was playing in the US female soccer league, it was clear that there is a business around female soccer, unlike in France. She was a star, an MVP, best female player when she was in the US, so it was very important that the stadium was packed with spectators. Marinette was the first female French star soccer player in the US.

Tell us about post-production. Did you tell the editor what not to do?

Not really. We did editing and VFX in the same facility—MPC in Paris, a division of Technicolor Creative Studios. They were responsible for duplicating the crowds in the stadium as well. The VFX team mapped the stadiums, which were all shot in France—even the stadiums that doubled for the US.

Where were your locations?

North of France and in Paris, and in Philadelphia.

You had a lot of closeups. Were they difficult because your camera is moving with the players, almost like a player or character itself?

Yes, because I wanted to be close to the emotions of the players during the match. It was not my intent to shoot a match the way you usually see it. I just wanted to be very close to my characters. To do that, we found the robot, the AGITO Dolly. It was a very good tool.

It had been used for fashion shows and TV. Ours was its first time on a movie in France. I wanted to be close to the players even as the moved. I love manga. The Japanese football (soccer) manga *Captain Tsubasa* was a source of inspiration. I was obsessed by those pictures. So Xavier tried to find the right tool for us. It could have been dangerous because the AGITO is around the players. But, we had a lot of people for safety, preventing the AGITO from colliding with the players, managing the speed and distance. We told the players, "Just respect a 3-meter distance from the robot and respect its speed.

Did you hire professional women soccer players?

We don't have a professional football (soccer) league in France for women. Even now. But all the players were club members.

Unbelievable. Was Garance Mariller, your lead actress, also a soccer player?

She played soccer in a little club for four years. It was good for me because she knew how to act with a ball and she was very precise. She trained a lot for three months before production began. When I was writing the movie, I saw a video of her on Instagram with text that said, "I play football." I thought, "So you will be the first to read the script." She was the first and the only one for the part, and she said yes immediately.

Did you do storyboards?

Yes, because Xavier and my assistant wanted me to do storyboards for the match. But it was mainly for Xavier because, for my part, I wanted to improvise these particular moments. I love to create some situations in the moment and he wanted to be very prepared. Which I can understand. So we did half-half.

I knew that I didn't want to film just a soccer match. I wanted to catch the emotions. Xavier and my first AD wanted storyboards to be reassured that it was going to be okay.

That's quite adventurous, improvising with your own money.

Yes. We can say that…

Do you think this movie will affect how France views women's soccer?

Yes, I think so, because during the promotion, we were speaking with the French Federation. We made a lot of noise here in France because there are no professionals today like Marinette 20 years ago. So they said, "Okay, we are going to change that in one year." We will see. It was our purpose to change the status quo with our movie. Currently, women soccer players are considered amateurs in France. They are paid when they play in a big club, but there are two or three big clubs in France.

Hopefully your film will work to bring about social change and make things better.

Change in one year, maybe. They promised.

Above: Xavier handheld with VENICE Rialto. Photo by Guillaume Bouqueau,VIGO FILMS. Below: Xavier mixed a SkyPanel and a PAR 64. “This gives us cold daylight from the SkyPanel, and at the same time, warm light from the PAR 64, he said.
Bottom: Marinette and team in foreground with VFX augmented crowd in background. As Virginie said, “Lots of hair to rotoscope.”

Xavier Dolléans, AFC on *Marinette*

Xavier Dolléans, AFC and VFX Supervisor Laurent Larapidie (R-L). Photo by Guillaume Bouqueau,VIGO FILMS.

Xavier Dolléans, AFC was the Cinematographer on Marinette. *He started as a camera assistant in Paris and worked in many departments: electrician, camera crew, Airstar technician and lighting balloon specialist for 9 years, including* Hugo, Midnight in Paris, *etc.*

Jon: Please tell us about *Marinette.*

Xavier: *Marinette* was shot with Sony VENICE. I'm a big fan of Sony VENICE since 2018. I started an in-depth prep on *Marinette* in September 2021 with Virginie Verrier, the Director. She wanted to do equipment tests to establish a distinctive style and to shoot soccer in a very specific way.

Virginie wanted to be very close to the actors. She wanted the camera to be very close to their faces on the field itself. So, no long lenses that you would normally expect in regular soccer coverage. But this is a biopic and an action movie. Everybody's running all the time. We find our camera constantly moving rapidly all the time. There's a lot of VFX work because all the seats in the background of the empty stadiums we shot have to be replaced with spectators. We had a lot of questions and did a lot of tests.

For the main cameras, we chose the Sony VENICE. For VFX backgrounds and spur-of-the-moment shots, we had the Blackmagic URSA Mini Pro 12K camera

Then we did tests with the AGITO from Motion Impossible. AGITO is a robotic dolly, sort of like a drone on wheels. When Marinette Pichon is a little girl, her soccer field is very basic, in the countryside. But when she grows up, you see her play on very big soccer fields. So, we needed to protect the grass because we were in actual stadiums. When you realize that an entire crew could be shooting for nine hours on the grass, this becomes something different. This is a negotiation with the stadium owners.

The AGITO became one of the tools that helped us, logistically speaking, to explain, "Look, we have this robot moving the camera and it can go everywhere on the field, and its pneumatic tires will not damage the grass and we can keep the entire crew on the sidelines." In that way, we were able to shoot very close to the soccer players/actors. In the process, we learned the difficult task of maintaining a straight line when someone is running.

Did you use Steadicam as well?

We did Steadicam for very selective pieces. But running was mostly done with the AGITO and nervous handheld camera operating.

I cannot imagine you being nervous.

I mean, nervous in the sense that the handheld camera, often in Rialto mode, is not as steady as a Steadicam or AGITO. But it adds "nervous" energy to the shot.

What lenses did you have?

We used the Atlas Orion 2x anamorphics. We did a lot of tests with anamorphic lenses because Virginie wanted to shoot anamorphic, but she also wanted to have a very discreet look. Not too much distortion, not much flare, but still the anamorphic look on the closeups. For the very wide shots, I used the 15mm T2.0 Summicron-C prime. I like this lens. Because it is a spherical lens, VFX is happy because it has very little distortion. Virginie was also happy with the way we were framing the wide shots with it.

From the Atlas Orion line, we used the 40mm to the 100mm focal lengths. We also used Angénieux anamorphic zooms (which have rear cylinders). And then, for some specific shots, we used 300mm to 600mm Canon telephoto lenses.

You were shooting in Super35 format—not Full Frame?

That was because we loved those lenses, they are S35 by nature, and I was not comfortable using an expander to make the Atlas Orions cover Full Frame and losing one stop of light in the process.

Where does Blackmagic come in?

Blackmagic offered an URSA Mini Pro 12K camera for testing when I was shooting *Germinal* in 2020. On *Germinal*, I tested it by shooting some flames against a black background and some plate elements for VFX. It handled the exposure well. Since it is a 12K camera, I was interested in using it on *Marinette* for the VFX elements again. The URSA 12K is also a very straightforward camera and easy to use.

Pauline Chevalier, First AC, checking out URSA Mini Pro 12K and Sony VENICE at the rental house.

We had a discussion with Laurent Larapidie, the VFX supervisor. I said, "If you have the extras in the stadium, and I'm shooting something else, maybe you can use the URSA 12K camera to shoot background plates and elements." He could use it with only one camera assistant. Sometimes, he was shooting all by himself. He moved extras into the sunlight and then into the shade because we were shooting under different kinds of available light situation.

Furthermore, the URSA Mini Pro 12K camera was helpful for me—especially at the end of the day after wrap and you see a beautiful sunset and all your other cameras are in the truck and the crew is almost on their way home. I could take the URSA 12K and grab some beautiful shots that would have otherwise been missed. Because Virginie was very sensitive to that, my instructions to the camera crew was to always keep a 40, 65 and 100mm Atlas Orions and the URSA 12K in a case, ready to go, outside the truck at the end of the day and even at the beginning of the day.

How did you match the URSA Mini Pro 12K and Sony VENICE cameras?

I'm lucky enough to work with Karim El Katari, colorist, and Florine Bel, color scientist. They are both former technicians from Eclair Laboratory and they are magicians. She created some looks that matched very well. Florine works with MPC and also does freelance jobs. We created a very specific look at the beginning of the show for all cameras, all matching through the ACES color pipeline. They are both so precise and they made a lot of helpful suggestions. They are an indispensable part of my crew.

Did you have a special operator for the AGITO?

Yes. The AGITO is like a drone on wheels. Basically, you have the pilot who looks only at the AGITO to keep it from colliding with the actors/players. You also have people who are spotting the action for safety reasons. And then you have the camera operator, working with wheels or fluid head controller. They have to coordinate their moves and know each other very well. The players interacted and moved with the AGITO as if it was another player. Sometimes they wondered, "Oh, is it going to stop now?" There are shots where the AGITO is in the middle of the action, surrounded by real players.

Tell us more about the VFX.

Marinette is an independent feature film, and the VFX budget was substantial. We scanned all the soccer fields and stadiums with drone photogrammetry. This was for 3D modeling with all the seats and MPC generated the extras to fill the stadium.

Did you keep track of camera lens data?

We tried. But the camera distance, height and everything else was moving all the time. So, for almost every shot, VFX involved match moving and rotoscoping. Some shots were very complicated. The last shot of the movie is very long. Marinette is talking to a journalist saying, "I'm going to quit." This is a very long single-shot Steadicam sequence. It is at the end of the match, so everybody's leaving. People are not simply sitting in their seats in the stadium. That was a difficult shot for VFX.

What were your ISO ratings for URSA 12K and VENICE?

The URSA Mini Pro 12K can be rated at 800 or maybe 1000 maximum for me. We used it mostly for daytime work where it was rated at 400 ISO. I really liked the way that you can use it very quickly by yourself. You can operate it solo; you have everything. Just attach a battery and go. I rated the VENICE at 2,500 for everything, even outside.

Above: Xavier explains, "This is the last shot of the film, a continuous Steadicam take. Marinette is telling a journalist that she is about to quit. You can see the stadium behind her, filled with extras thanks to VFX. The players on the field are real. This was difficult for VFX because she is moving in the middle of the soccer field. We pull focus to the coach, so VFX has to track and match move everything.
Below: This is the end of the Steadicam shot as we follow her into a corridor and the locker room. She turns and faces the camera.

Why didn't you use the VENICE for background plates?

We were using the VENICE for other things. With the URSA 12K, we were able to shoot in parallel with a splinter unit. We had 3 VENICE cameras: one ready on a crane, another for Steadicam and another for the AGITO. The URSA 12K was only for the splinter unit to be used very freely—and by me, as I mentioned before.

I'm happy that the cameras were being used this way. I was able to use my three VENICE for the turnaround setups of the main action. The question is more, "How do I take an URSA 12K camera and have it work with the other cameras? Actually, the camera is very good if you use it in daytime, you expose correctly, and you have a good color scientist to do the color matching. Suddenly the camera gives you more freedom on set. You can say, "It's a wrap, but I'm going to do extra shots." The camera crew can pack up. There is no extra cost to the production company.

With Sony VENICE shooting Super35 4K 6:5 ratio anamorphic squeezed, then what resolution did you choose for the URSA Mini Pro 12K camera?

6K to 8K and 12K. 6K to 8K for a bit of slow motion. And 12K for the rest. Shooting in Blackmagic RAW. On the VENICE, we recorded in X-OCN ST. But if the ISO was below 3,200, then I moved to X-OCN XT to have the best signal possible when I'm going lower in exposure range.

How did you satisfy Virginie's mandate for a less obtrusive anamorphic look?

Previously, I have exposed the Atlas Orion lenses between T2.8 and T2.8 1/2 most of the time. But on *Marinette*, to make the anamorphic look less visible, I shot everything at T4. This is something that I really I like about these lenses: you can have different looks depending on the aperture you set. At T4, there is a little bit less of an anamorphic effect. But it was a good sweet spot for this movie.

Frames from *Marinette*

Above: Live action foreground—VFX backgrounds. Below: running in Philadelphia. Bottom: Xavier said, "This was an homage to Rocky, on the same steps in front of the Philadelphia Museum of Art. I shot it handheld. Of course, Garett Brown, ASC did the famous shot with his Steadicam.

Above: This is Burano, Italy. It's a 45-minute vaporetto ride from Piazza San Marco in Venice to the north end of the Lagoon. Buildings are painted in beautifully bright colors that could work as an on-location color chart. The three-story houses are jammed together, side by side and painted different colors long ago to mark the property lines. Anther explanation is that the local fishermen and sailors used bright colors on their houses, the better to see them at night or in the rolling fog of the Lagoon. Burano is known for its seafood. Try the risotto de gò, but better to taste it in a Burano restaurant than try to catch the spiny grass goby (gò) fish yourself.

Below: This is BURANO, the new camera from Sony. Its Full Frame 8.6K sensor can capture every nuance and color painted on the houses of Burano island. BURANO, the camera, is the latest addition to the Sony Cinema Line.

With in-body image stabilization and in-camera variable ND filters, BURANO is unique, ergonomic, and extremely mobile. BURANO could fit in a backpack on a documentary about the Venetian Lagoon. BURANO might also work as a companion camera to its larger sibling, VENICE. Let's take a tour on the following pages.

New Sony BURANO

BURANO blends the front end styling of VENICE with the rear curves of FX6. BURANO has the same front PL Mount over a Lever-Lock E-mount. However, the front sensor block does not detach the way VENICE does, so there is no BURANO Rialto tethering. BURANO is 1 inch shorter and 3 pounds lighter than VENICE 2. The body is magnesium and aluminum.

Size Comparison: Sony VENICE 2 8.6K

Sony BURANO Studio and Handheld Mode

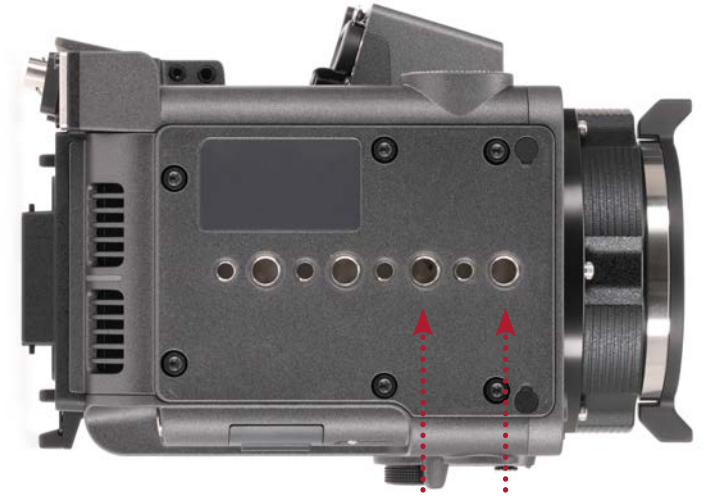
Compact studio mode with PL mount SIGMA 65mm FF High Speed Cine Lens, IBIS image stabilized.

Nimble handheld mode with auto focus, IBIS image stabilized, FE 24-105mm G OSS E-mount Zoom

Sony BURANO Camera Body Views: E-mount

Sony BURANO Camera Body Views: PL Mount

BURNANO Top



BURANO Bottom

Fortunately, BURANO and VENICE bottom forward 3/8-16 and 1/4-20 mounting threads are in the same position.

VENICE 2 Comparison:

VENICE 2 Top

VENICE 2 Bottom

BURANO PL Mount over E-mount

BURANO has the same front end as VENICE, although it cannot be removed for an Extension System.

At left, with native E-mount

Below: PL Mount attaches with 6x captive 2.5mm hex screws.

BURANO PL Mount

Front view of PL Mount

Rear view of PL Mount

3/4 side rear view

BURANO PL Mount

BURANO with PL Mount attached.

Sony BURANO Handheld

The EVF LCD connects with a cable similar to FX9 and F55. It is a 720P signal.

Sony BURANO with FE 24-105mm G OSS E-mount zoom lens, handgrip, EVF—nimble, ergonomic and light, sits comfortably on your shoulder even without a shoulder pad or base plate.

Handgrip and arm adjust quickly for waist level operating, or wherever you would like the camera to be.

Outputs at rear of BURANO, top to bottom:
HDMI
SDI OUT 1
SDI OUT 2
Timecode
Reference
Ethernet
12 V DC Input

The handgrip connects via a mini jack similar to FX9.

Nobu Takahashi, GM of Professional Imaging, introduces Sony BURANO

Nobutatsu (Nobu) Takahashi, General Manager of Professional Imaging Technology Business Unit, Sony Corporation (Sony Cinema Line) graciously volunteered to introduce the new Sony BURANO camera to FDTimes readers.

Jon: Nobu-san, congratulations on the new BURANO camera. How did it come about?

Nobu: Thank you very much. The idea began about five years ago. When we developed the strategy for the Cinema Line, we predicted that many OTT streamers would be creating new feature films and episodic dramas at around 2023. To address that market, we thought that we should have a highly mobile camera with a prestigious cinematic look. So that was the idea that sparked the idea for BURANO.

Rhetorically asking: couldn't they just use a regular VENICE?

Yes, that's one option they have at the moment. For very high budget filming, they use VENICE and other high-end cinema cameras, but at the same time they also need high mobility cameras for those productions. Not only for feature films and episodic dramas, but also for non-scripted content like documentaries or wildlife shows. Those genres are increasing rapidly in the OTT streaming area. Scripted and also non-scripted content is increasing a lot. That is why we think there is a demand for this high mobility camera. That was one of the main reasons we had to start this project.

Did you get these ideas from market research—talking to DPs, rental houses, camera assistants, crews, directors, producers?

We are always listening to filmmakers all the time. My overall intention is to go into the market, not alone, but to also bring the engineers and product planners so that we understand what our customers need as a tool. At Sony, we have engineers and lots of development is going on already. These are the seeds of our technology development. We know that side of things, but we may not know the artistic and creative side. That art belongs to the filmmakers, cinematographers and directors. We have technology. And so, with art and technology, by multiplying those two together, we always should think about how our technology can contribute to the creativity of the filmmakers and to the industry of the cinema. And then we came up with the idea of BURANO, a very unique concept.

Lighter, smaller, more hand-holdable...

Shoulder-resting profile, with a compact body, and lightweight. Actually, BURANO is 33% lighter than VENICE. It's very good for high mobility shooting, with a lots of core technology development inside.

Such as continuously variable ND and image stabilization?

I was a mechanical engineer for more than 10 years when I started my career at Sony. There is a very specific engineering department that is in charge of core technology development. They are not necessarily working on an individual project but rather, they are looking at long-term technology development. They always like challenges. They want something different and to be first.

They had already been developing in-camera variable ND and in-body image stabilization. So, the challenge was to implement those concepts into a new camera. That was the technology part of the project.

There was also a research part of the project. We engaged an in-depth study of the cinema market when we started this project. It was important to understanding the market five years ago and then plan ahead so that research and the core technologies could come together in this new camera.

What kind of the research did you conduct?

Understanding the market is the most important part for me. But, when we started this project, most of the time was during the COVID pandemic. We had to quarantine for more than three years. That was challenging, but it allowed us to have online meetings for research. We reached out to colleagues in New York and Hollywood and around the world. Our discussions were not limited to filmmakers and cinematographers, but also producers, DITs, colorists, camera crews and rental houses. We wanted to learn what kind of challenges they had and what kind of jobs they were doing.

We found out that many of them were working on OTT feature films and episodic dramas. They said that those streaming feature films had rather high budgets. But at the same time, there was an increasing number of unscripted dramas, documentaries, wildlife shows, music videos, and commercials on the web is increasing. For the big budget streaming feature films and series, they usually rented VENICE or highly acclaimed cameras of other brands.

But at the same time, many of the people we met via online meetings mentioned that they owned their own cameras, maybe not the ones just mentioned, but they owned lighter, smaller, more handholdable cameras of all brands, including Sony's FX series. The reason was timing. They get a phone call. The producer wants to shoot next week or even tomorrow. If they own their cameras and lenses, then they are ready to go out and shoot right away. They are owner-operators and they are crewing the increasing number of these non-scripted show. And that is when I thought that we should have this new camera called BURANO. The solo owner-operator or filmmaker with a small crew would love this camera. So that was one finding that came out of our research.

After the research and technology discussions, what came next?

Product planners, with Toshi Kanayama in charge, took their understanding of the market to develop a strategy. The concept of the camera came next. That's very important. Understand the filmmakers first. Listen to the cinematographers. Then create the camera. The result was BURANO, a camera with a cinematic look and high mobility.

Who might use the camera the most after it is released? Will it be owner operators that you just mentioned—or rental houses and production companies?

We have to wait and see after the launch. It's interesting: our thoughts and the acceptance of the users can sometimes tend to be different. I think it's the filmmaker's choice. When we established the concept, we thought that lot about the solo operator or small crew who would love a camera with which they can film right away. I think it will be very good for those users.

I also think BURANO will also be very attractive to high-end DPs and camera crews to bring along on their feature film as a complement to a VENICE, as their second, third, and fourth camera.

I totally agree with that. To be different from the existing tools like VENICE is very important because we do have a very high-end VENICE camera as an option at this moment, but up until now, we did not have a lighter, more compact camera with image stabilization so the user can go handheld, perhaps at waist level, to move around and get closer to the actor. To be different from the others is very important and I call it unique. I always tell the engineers that we have to be unique. I have to be unique as a person. So does the engineer. But at the same time, the camera has to be unique as well. It has to have its own character.

We often obsess about lenses having character. And now you have created a camera that has character as well. I can picture it. The sun has set. It's magic hour. There's very little light left and the director wants a long dolly shot, but there's no time to lay track and no, they did not rent a remote head with gyro stabilization. The DP calls for BURANO. It goes on the dolly, and it's bouncing around on the bare, un-tracked ground. The internal image stabilizer steadies the image. The Director is happy because they can do a few more takes. The DP is happy because the internal variable ND lets them adjust exposure in fine increments as the sky gets darker. And the producer is happy because they got the shot.

Yes. If the camera is unique, filmmakers will find out new ways to use new tools. That's why we cannot foresee who will actually use this camera. That's always surprising. Another recent surprise is that real filmmakers are using the Sony FX3 camera so often. We had hoped those top-end cinematographers would use the FX3 when we first established the concept, and recently a lot of DPs are showing up in our DMPC (Digital Motion Picture Center) facility and they take out their FX3 from a backpack. They love it. That's amazing. .

Up until this point, I think manufacturers would either do a very high-end camera or an entry-level camera. There was very little in the middle. Why was the middle market avoided up to now?

That's true. There are not many other cameras in this range. When I started to think about the concept of this camera, I heard lots of feedback from the market that there is and there will be an increasing market for the mid-range. As I mentioned, not just the OTT drama, episodic dramas or feature films, but also non-scripted content will be rising because customers want content. And then we have another option for the viewer—streaming and on-demand streaming. In that sense, I think the mid-range camera, as you call it, is defined as mid-range only by its price. But aside from price, it is a very different concept of a camera that was never done before. What BURANO can do has been done before with lots of peripherals added to previous cameras, but it was not easy for the freelance camera operator or an independent filmmaker to have all those peripherals.

I think it's going to surprise a lot of people when BURANO launches because the rumor sites are proclaiming it is going to be like an FX11, just another step above the FX9. I never imagined that it was going to be this advanced or unique. How did you come up with the name? I thought maybe you were going to name it after a surfing spot like Malibu or Mavericks.

Kanayama-san led discussions not only with our Japanese colleagues, but at the same time we talked with the local sales companies around the world. We wanted the name to be unique and very easy to pronounce. Even the name of our company, Sony, is short and easy to pronounce. So I followed that idea and BURANO became the name of this camera, after a small island in the Venetian lagoon.

I like the name.

I like it and I'm glad that you do too. Then it is up to us and the filmmakers to enjoy BURANO in use on their productions. After

its release, we would like to get feedback from users so our software developers can plan future version updates and make this camera even better. These days, it's not just about releasing the product. It is also listening to the customers in order to polish the tools so that they will be able to do more artistic filmmaking. So that's our intent. We are eager to listen to the customers' voices.

So, if a DP or an assistant has an idea, whom should they contact at Sony?

They should contact their local Sony representative who will pass it on to us. We have a very good team worldwide. We all met in Tokyo at the end of June. All the representatives of the sales companies worldwide gathered in Yokohama. We have very tight connections with all our colleagues so that we can collect feedback from our worldwide customers.

That's good to hear. We members of the camera crew love to complain...er...give suggestions about the equipment and hope that someone listens. It's great that you are willing to listen.

I think that's very important. And not just collecting the feedback from the sales representatives, but at the same time, it's very important for someone in top management within Sony, or an engineer, to go to the market to understand and listen to the customers. That's a very important concept for me. That's why I often go to Los Angeles and I always show up at events and trade shows. I always try to bring an engineer along with me. Not just a product planner. But our engineers have to be on site to understand and feel what the customer or user feels.

Listening to the DPs and what they're doing is not just for the short term. It is for the long term. Understanding the needs of the DP very early in the timing of the development is very important. That's why we have the DMPC facility in Glendale. Sony's top management visited the DMPC around the time of Cine Gear and met with ten DPs at a round-table discussion about the future of filmmaking. Even Maki-san, the President and CEO of Sony Corporation, is listening to the DPs. That is very helpful in our planning and development for the cinema industries. I'm very lucky that our very good top managers, colleagues and my engineers all love filmmaking.

But if you meet 20 DPs, don't you get 20 different opinions?

We do. And we understand that. We think every comment is true because that's why they're very unique. They are artists. So the comments should be different. We try to find a common thread—what is the essential message from them so that we can translate the artistic requests to into engineering development

What areas do these engineers work in?

I try to arrange one person from each area of development. I try to bring one electrical engineer, ideally one mechanical engineer, and one software engineer. Sometimes I bring the industrial designer. I think I brought three creative designers to NAB. They're very important. They know how the products should be designed ergonomically. In that sense, they have to watch how filmmakers are using the camera. Everyone on the development team should understand who's using it and how they're using the camera.

Is the sensor in BURANO the same as VENICE?

No. In the specifications, they share some common numbers but the sensor itself is different.

And yet, the two cameras match beautifully.

Oh, yes. The color filter array is the same. It was our intent to match the BURANO and the VENICE cameras. And not just VENICE, but at the same time we try to match all the Cinema Line cameras. That's one of the main concepts of the cinema line look and availability.

The user interface on BURANO is logical and intuitive. It reminded me of FX3 and some Alpha cameras.

The details are not exactly the same as VENICE, but for the major functions, we made it easier for the customer to use the menus.

BURANO has the same clever E-mount and PL-mount front end.

We want to give customers the option to use any lens they want. In that sense, the PL mount is a must. But at the same time, our research showed that for web commercials, music videos and non-scripted content, users all appreciated autofocus very much. That's why we thought that E-mount might benefit those users and customers. We were very lucky to find out that they are very interested in Sony's autofocus on E-mount lenses.

We have very good glass in Sony G Master lenses these days, with autofocus, auto iris and very high technology.

It is always good that when you have new options added to your filmmaking. You can do your filming with PL lenses that have their unique look to do the storytelling, but at the same time, having options with autofocus technology may help you create something new. You'll decide how to use it, but we are giving you the option by understanding your needs.

We see a lot of multiple cameras lately. Is this the future?

Yes. BURANO has a short profile and in-body image stabilization. It's different from VENICE. Being unique, it can work in combination with existing cameras like VENICE. I think that'll give lots of options to the filmmakers. At the same time, new ways of filming are increasing. There might be other options for the customer. I have seen not only huge stages for the feature films, but at the same time there are many mid-sized and small-sized studios for virtual production and XR wok. I visited a lot of them. I feel that younger filmmakers tend to try something new—new styles, new ways of shooting.

In the Cinema Line department, we have three terms: imagine, create, inspire. Not only do the DPs use their imagination for storytelling and creating a film that inspires the audience, but at the same time we, the engineers and myself, everybody in Sony, also in the sales companies, need to have imagination for the future of filmmaking. Then we create the camera and its system. And finally, we inspire DPs and the audience and they inspire us. I think those are very good words to represent the activities that we are doing together with the creators and filmmakers.

Those words should inspire filmmakers to embrace your Cinema Line, confident in knowing that someone is listening.

You are the ones who are inspiring me a lot.

Thank you very much.

Sony Cinema Line: FX3, FX6, FX9...

FX3

FX3 3.8K
Sensor: 12.1 MP actual / 10.2 MP effective
Sensor size: 35.6 x 23.8 mm
Steadishot: Image Stabilization of Sensor
No Internal ND
Phase Detect Auto Focus
Base/Enhanced ISO: 800 and 12,800
Max Res: 3840 x 2160p XAVC S-I 4:2:2 10-Bit
Variable framerate UHD: 1-120 fps
External RAW: 44264 x 2408 16-Bit HDMI
Alpha style E-mount — Full Frame & Super35
Weight (body only): .640 kg / 22.6 oz
Size (body only): 129.7 mm / 5.1" wide 77.8 mm / 3.1" high 84.6 mm / 3.3" deep
Sony Z-Series 7.2V DC
Camera Introduced Feb 2021

FX6

FX6 4K
Sensor: 12.1 MP actual / 10.2 MP effective
Sensor size: 35.6 x 23.8 mm
No Steadishot
Internal Variable ND: Clear, ND.6 - ND2.1
Phase Detect Auto Focus
Base/Enhanced ISO: 800 and 12,800
Max Res: 4096 x 2160p XAVC-I 4:2:2 10-Bit
Variable framerate 4K: 1-60 / UHD: 1-60 fps
External RAW: 4096 x 2160 16-Bit SDI
Alpha style E-mount — Full Frame & S35
Weight (body only): .885 kg / 1 lb 15.4 oz
Size (body only): 110 mm / 4.33" wide 115 mm / 4.5" high 140 mm / 5.5" deep
Battery: Sony BP-U Series 14.4V DC
Camera Introduced November 2020

FX9

FX9 4K
Sensor: 20.5 MP actual / 19 MP effective
Sensor size: 35.6 x 23.8 mm
No Steadishot
Internal Variable ND: Clear, ND.6 - ND2.1
Phase Detect Auto Focus
Dual base ISO: 800 and 4000
Max Res: 4096 x 2160p XAVC-I 4:2:2 10-bit
Variable framerate 4K: 1-60 / UHD: 1-120 fps
External RAW: 4096 x 2160 16-Bit SDI
Lever Lock E-mount — Full Frame & S35
Weight (body only): 2.0 kg / 4.4 lb
Size (body only): 146 mm / 5.75" wide 142.5 mm / 5.61" high 229 mm / 9.02" deep
Battery: Sony BP-U Series 14.4V DC
Camera Introduced September 2019

Note: Some of the specifications on this page and the next are from FDTimes research, math or estimates — and are not official Sony details.

Sony Cinema Line: VENICE, VENICE 2, BURANO

VENICE

VENICE 6K
Sensor: 24 MP
Sensor size: 35.9 x 24 mm
No Steadishot
Internal ND: Clear, ND.3 - ND2.4
No AF
Dual base ISO: 500 and 2500
Max Res: 6048 x 4032 X-OCN 16-Bit
Variable framerate 6K 3:2 FF 1-60 fps
Internal RAW: 6048 x 4032 16-Bit
PL Mount & Lever Lock E-mount—FF & S35
Weight (body+PL): kg / lb
Size (body only): 147 mm / 5.875" wide 158 mm / 6.25"" high 235 mm / 9.375" long
Battery: 14.8v V-Mount rear plate
Camera Introduced September 2017

VENICE 2

VENICE 2 8.6K
Sensor: 50 MP
Sensor size: 35.9 x 24 mm
No Steadishot
Internal ND: Clear, ND.3 - ND2.4
No AF
Dual base ISO: 800 and 3200
Max Res: 8640 x 5760 X-OCN 16-Bit
Variable framerate 8K 3:2 FF 1-30 fps
Internal X-OCN XT/ST/LT: 8640 x 5760 16-Bit
PL Mount & Lever Lock E-mount—FF & S35
Weight (body+PL): 4.3 kg / 9 lb 7.7 oz
Size (body only): 152 mm / 5.98" wide 158 mm / 6.25" high 250 mm / 9.84" long
Battery: 14.8v V-Mount rear plate
Camera Introduced November 2021

BURANO

BURANO 8.6K
Sensor: 57 MP
Sensor size: 35.9 x 24 mm
Steadishot: Image Stabilization of Sensor
Internal Variable ND: Clear, ND.6 - ND2.1
Phase Detect Auto Focus
Dual base ISO: 800 and 3200
Max Res: 8632 x 4856 X-OCN 16-Bit
Variable framerate 8K 17:9 1-30 fps
Internal X-OCN LT: 8632 x 4856 16-Bit
PL Mount & Lever Lock E-mount—FF & S35
Weight (body+PL): 2.9 kg / 6.39 lb
Size (body only): 146 mm / 5.75" wide 143 mm / 5.625" high 218 mm / 8.58" long
Battery: 14.8v V-Mount rear plate
Camera Introduced September 2023

The Sony Cinema Line also includes the FX30, an APS-C variant of the the FX3, and the FR7, a Full Frame PTZ camera.

FX30
Sensor: 20 MP Super35 (23.3 x 15.5 mm)
Camera Introduced September 2022

FR7 PTZ Camera
Sensor: 10.3 MP Full Frame
Camera Introduced September 2022

BURANO Product Planners, Product Manager and Project Leader

Toshiyuki (Toshi) Kanayama

Takuro Ema

Yukie Sugaya from the Sony HQ PR Team got the BURANO Team up early for an online meeting and briefing with FDTimes. It was 7am at Sony headquarters in Yokohama and 8pm in New York. The cast of characters included Toshiyuki (Toshi) Kanayama and Takuro Ema from the BURANO Product Planning Team. Katsuya Kondo is the BURANO Product Manager and a legendary engineer. Yasuo Sakai is the Project Leader of BURANO.

Toshi: Let us briefly introduce a new CineAlta camera. It is a very new concept. As you know, VENICE is our highest quality cinema camera. And then, we have the FX9 which is kind of a run and gun style camera, good for mobility. And now, between these two, we introduce a new camera that we call BURANO.

Beginning about five or six years ago, we heard that streaming was on the increase. Companies that provide internet streaming services wanted to have a lot more content. But the budgets might be limited by the quantity that would be needed. Also, some of this content would be created by a small staff, or even in one person. So, that's why we came up with the concept of this compact and small, lightweight, and high mobility camera. Even in one person can shoot with it. But this camera still has very high quality and a cinematic look.

First of all, to achieve high mobility, we realized that it needed in-body variable ND filters. Second, this is a world's first digital cinema camera with a PL Mount that has in-body image stabilization. In the past, of course, we had in-body image stabilization E-mount cameras, but this is first for a PL mount as well. We hope this is helpful for documentary and wildlife cinematographers.

And third, the sensor has phase detection AF (Auto Focus) for E-mount lenses.

BURANO is an 8K Full Frame camera with a phase detection, touch-screen AF, with Dual Base 800/3200 ISO, 16-stops of exposure latitude, and it can record internal raw X-OCN LT. It has the same PL mount over E-mount design as the VENICE. Among its many resolutions and frame rates, BURANO will shoot 8K 30P Full Frame and high frame rate (slow motion) 4K 120P in Super 35 crop mode. You can record not only X-OCN, but also XAVC. (VENICE records ProRes but not XAVC.)

The handgrip with remote controls is similar to the FX9, but we have improved its usability. We heard customers telling us that it was difficult to change the angle of the arm. But now we have improved it so it is very easy to adjust.

Jon: Does the addition of phase detect on the sensor in any way change or soften the image compared to VENICE?

No. The image will match the look of VENICE 1 and 2. It's not the same sensor, but the image science is similar. Also, we have the s709 preset that can cover the entire Cinema Line and match the look. And that includes FX3, 6 and 9.

Would you please tell us about LUTs?

BURANO is getting 4 new looks that can be selected from the menu. They are called WARM, COOL, VINTAGE, and TEAL AND ORANGE. These new looks are variations of s709. In addition to s709, we are adding these four new looks as presets.

The WARM LUT aims to create a soft and smooth atmosphere. Highlight areas are warmer and richer. Skintones look smooth, lively and healthy. There's no change in other areas.

Then COOL LUT is my favorite new look. The idea is to create a cool feeling. Shadow areas take on a soft blueish glow that feels almost illuminate by a blue neon light. It is like a cool city that has not yet woken up. Or magic hour. My favorite.

The concept of the VINTAGE LUT is low saturation. It's like a color photo that has faded more toward black and white and the brightness has decreased.

TEAL AND ORANGE is kind of the current new style for a look. There is a contrast between foreground and background and people in the frame. It looks kind of blueish.

These LUTS, or call them Looks, are a jumping off point. You can add to them, refine them, create your own and load them into the camera. For people who do not have time budget or experience for color grading, it is easy to use these looks, we think. We're thinking about possibly expanding this look library in the future, but we are starting with these four basic looks for BURANO.

Are these LUTs embedded into the clip metadata?

Yes. We've embedded the cube file metadata into the video file and into the clip. Also, we are planning to provide dot cube files as well for post-production.

If you're shooting X-OCN LT, the LUTs are not baked in. It's just metadata. And if you're shooting XAVC?

There are two options. Not baking it in and with the embedded cube file, or baked. So, you have a choice. In Cine EI, we cannot bake. But in custom mode, we need to input the cube file into the other file in the camera, and then use that cube file.

Would you please tell us about the planning, design and styling of BURANO?

After talking to users—DPs, camera assistants and rental houses—we heard that the user interface was very important for them. We realized there were six frequently adjusted items that should be visible in the display panel menu and they should be easy to change. Internally, we call them the Big Six.

Big Six means a function on the display panel that allows you to select items that you frequently adjust or values you want to instantly check during shooting. It includes FPS, EI, Shutter angle, ND, LUT and White Balance. We incorporated that into BURANO and made sure that the display could be attached almost anywhere on the camera and would be flexible to be used by the camera operator of assistant. So, it's very flexible.

How does the image stabilization work?

Takuro: It is a new technology in BURANO. For example, FX3 has image stabilization, but no ND filter. FX6 and FX9 have a variable ND filter, but no image stabilization. To combine both is very difficult. So, our super engineers achieve that combination for BURANO. It is a world's first technology.

Is it delicate and are precautions necessary when shipping?

Takuro: It works pretty much the same way as the Alpha cameras work. The sensor gets locked magnetically when the camera or the stabilization is off.

What does the menu setting "PL stabilization" mean?

Toshi: We have designed a stabilization program especially for PL mount lenses. The menu changes when you use an E-mount lens. If PL lens and body can communicate the focal lengths via Cooke /i, it's automatically set. If not, you can select the focal length and that helps determine the aggressiveness of the stabilization.

BURANO also records lens data in the video file as metadata?

Takuro: Yes, it records Cooke /i.

At this point, Takuro decides to turn the tables and question the questioner.

Takuro: Whom do you think will be interested in this kind of camera? Rental houses or more owner-operators? And where do you think this camera will sit?

Jon: As you said, it's everybody. BURANO has a really broad appeal with something for everyone. It's affordable enough for owner-operators to have. I always enjoyed owning my own cameras because they helped logistically and creatively. When Tanya Lyon kindly sent a BURANO here, it proved to be high-end and robust enough for rental houses to enjoy as well because it's very solidly built.

Toshi: Yes, It's a metal body, made of magnesium, even for the flap that covers the media card.

Jon: So, it will be rugged for rental houses. It will be great for documentaries and streaming services, but I think it will also wind up on big movies. A big movie might have, three or four VENICE 2 cameras, and they might have 10 or more BURANOs. We're seeing many movies using multiple cameras. It sometimes seems as if it's easier and faster to have a camera attached to each lens than losing time by having to change lenses.

Some examples are the many VENICE and VENICE Extension System (RIALTO) rigs that Claudio Miranda, ASC had on *Top Gun: Maveric*k, as did Jacques Jouffret, ASC on *Gran Turismo*.

Takuro: This camera is a new challenge for us. There are many functions and also the concept itself is something new, which Sony hasn't been able to challenge for a long time. So, we would like to have lots of customer feedback so we know if we were right—and if we need to correct something, we can work on it as soon as possible.

Jon: How was the concept different from what came before?

Takuro: It's not totally different, but in a cinematic way, we tried to combine mobility as much as possible. We engaged the auto focus system for the first time in a CineAlta system. Stabilization is also part of the new concept. We weren't a hundred percent sure that all the customers will accept these things. So, we like to hear your opinion.

Jon: Those were my two favorite things on BURANO: stabilization and really good auto focus for when you're shooting solo. When I used the camera, I was amazed that the IBIS (in-body image stabilization) did not interfere with panning. In the past, using IBIS could result in lag. When you stopped panning, the image would keep going. This was not the case. I liked the way you could adjust it.

Takuro: We hope everyone else likes it as well.

Jon: Where is BURANO designed?

Takuro: Everybody is at our Yokohama headquarters.

Jon:

I look forward to visiting in November. Thank you.

Studio mode PL Mount

The EVF is mounted facing rear.

with SIGMA 65mm FF PL Mount Prime

Attach the EVF Monitor on the camera right side for a VENICE style menu main display

Handheld mode E-mount

The EVF is mounted facing out because the eyepiece loupe has a 90° mirror.

Sony BURANO handgrip

BURANO EVF Positions

The EVF slides along a NATO rail and can be positioned almost anywhere: left side, right side, front, rear.

Camera System

A wise camera assistant once said, "Cameras are only as good as their lenses and AKS (All Kinds of Stuff — accessories)."

BURANO arrives at the same time as the new Angénieux EZ-3 Zoom lens, among many other choices. More about the EZ-3 lens in the following pages.

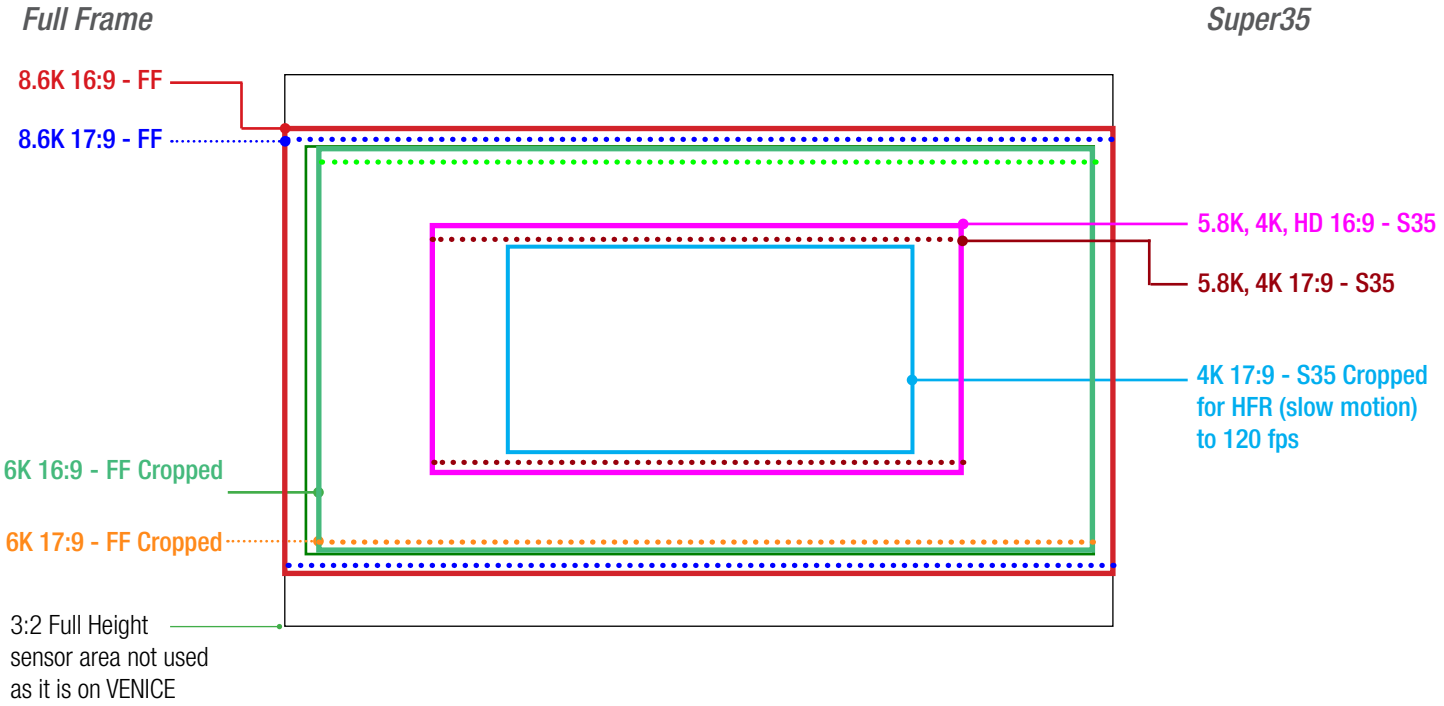
Wooden Camera Cage and AKS

The team at Creative Solutions got 3D outlines of the new BURANO camera just a couple of weeks ago. You can almost hear the CNC machines carving solid blocks of aluminum into sculpted cages, plates, hand-grips, rods and baseplates for the new camera. Dominick Aiello and team have devoted special attention to devising an intuitive design for mounting the Sony EVF Touchscreen in a variety of locations.

These are renderings (left and below). The real ones will be coming soon.

Of note: The Wooden Camera Accessories for BURANO will include a completely redesigned Accessory Power Breakout D-Box+ which connects to the camera's native V-mount plate, providing multiple power ports along with additional connectors for expanded camera connectivity.

BURANO Imager Modes, Aspect Ratios, Formats, Resolution, etc.



Imager Mode	Format [6]	Resolution	W x H (mm)	Project Frame Rate	fps
8.6K 16:9	Full Frame	8632 x 4856	35.9 x 20.2	23.98, 25, 29.97	1-30
8.6K 17:9	Full Frame	8632 x 4552	35.9 x1 8.9	23.98, 24, 25, 29.97	1-30
6K 16:9	Full Frame cropped	6052 x 3404	33.6 x 18.9	23.98, 25, 29.97, 50, 59.94	1-60
6K 17:9	Full Frame cropped	6052 x 3192	33.6 x 17.7	23.98, 24, 25, 29.97, 50, 59.94	1-60
5.8K 16:9	Super35	5760 x 3240	24.0 x 13.5	23.98, 25, 29.97, 50, 59.94	1-60
S35 5.8K 17:9	Super35	5760 x 3036	24.0 x 12.6	23.98, 24, 25, 29.97, 50, 59.94	1-60
4K 17:9	Super35 cropped	4096 x 2160	17.0 x 9.0 [7]	23.98, 24, 25, 29.97, 50, 59.94	1-60, 100, 120

If an imager mode is not shown in the chart above, you can still choose any aspect ratio you desire with user-defined frame lines. Then, simply pick the closest sensor mode that fits, and crop the remainder in post.

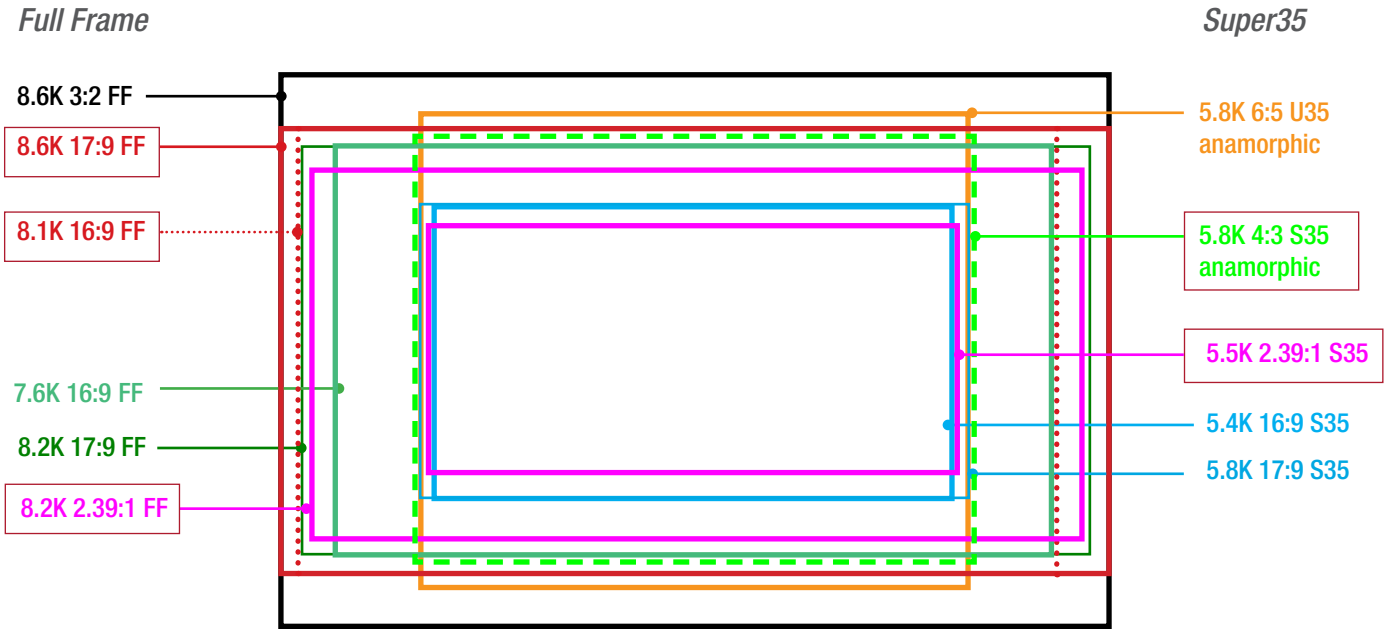
6: FF=Full Frame. S35 = Super35.

7: Super35 cropped is slightly larger than Super16 film format, which is 12.52mm wide x 7.41mm high.

In case anyone is wondering whether there will be more options, Nobu Takahashi said, in his interview, "After the release, we would like to get feedback from users so our software developers can plan future version updates and make this camera even better. These days, it's not just about releasing the product. It is also listening to the customers in order to polish the tools so that they will be able to do more artistic filmmaking."

The chart on the next page is a good example of how Sony adds additional functions, frame lines, formats and imager modes to their cameras.

Comparison to VENICE 2 V2.00 Imager Modes



Red Rows indicate new Imager Modes introduced in V2.00 update

Imager Mode	Format [2]	Resolution	W x H (mm)	Project Frame Rate [3]	fps [4]	License [5]
5.4K 16:9	S35	5434 x 3056	22.6 x 12.7	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90	-
5.5K 2.39:1	S35	5480x2296	22.8 x 9.55	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90, 96, 100, 110, 120	-
5.8K 17:9	S35	5792 x 3056	24.1 x 12.7	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72, 75, 88, 90	-
5.8K 6:5	U35	5792 x 4854	24.1 x 20.2	23, 24, 25, 29, 47	1-48	Anamorphic
5.8K 4:3	S35	5792 x 4276	24.1 x 17.8	23, 24, 25, 29, 47, 50, 59	1-60	Anamorphic
7.6K 16:9	FF	7680 x 4320	32.0 x 18.0	23, 24, 25, 29, 47, 50, 59	1-60	Full Frame
8.1K 16:9	FF	8100x4556	33.8 x 19.0	23, 24, 25, 29	1-48	Full Frame
8.2K 17:9	FF	8192 x 4320	34.1 x 18.0	23, 24, 25, 29, 47, 50, 59	1-60	Full Frame
8.2K 2.39:1	FF	8192x3432	34.1 x 14.3	23, 24, 25, 29, 47, 50, 59	1-60, 66, 72	Full Frame
8.6K 17:9	FF	8640x4556	35.9 x 19.0	23, 24, 25, 29, 47	1-48	Full Frame
8.6K 3:2	FF	8640 x 5760	35.9 x 24.0	23, 24, 25, 29	1-30	Full Frame

If an imager mode is not shown in the chart above, you can still choose any aspect ratio you desire with user-defined frame lines.
Then, simply pick the closest sensor mode that fits, and crop the remainder in post.

2: FF=Full Frame. S35 = Super35. U35 is Angénieux's good designation of formats larger than Super35, with image heights greater than 18 mm and usually around 20 mm. It can also be called S35+ but neither designation is official to Sony.

3: For simplicity, Project Frame Rate numbers are abbreviated. 23=23.98; 24=24; 25=25; 29=29.97; 47=47.95; 50=50; 59=59.94

4: These frames rates are for standard base ISO 800.
In high base ISO 3200, 1-7 fps is not available.

5: You only need the Anamorphic License if you want to desqueeze the image on the EVF or monitors. If you are shooting with spherical lenses and would like this sensor mode, then you can select it without a license.

BURANO Menus

If you are using E-mount autofocus lenses, the EVF touchscreen is your Portkey to the magical world of really good touch-to-focus operation.

The Big Six Menu. You can attach the EVF Monitor to the camera right side Of BURANO for a VENICE style menu main Big Six view, Quick Menus and Deep Dive Menus as well.

View on LCD monitor.

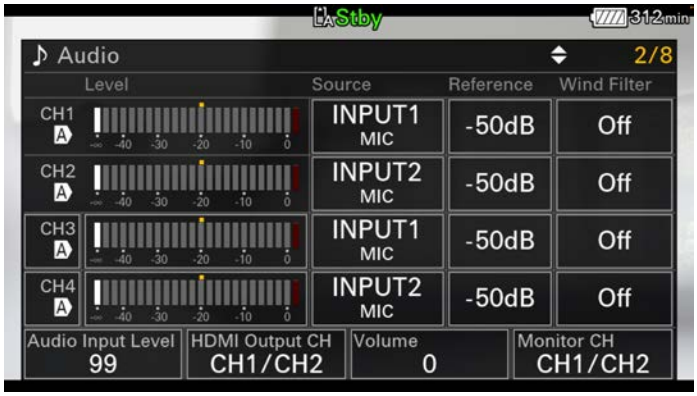
1push DISP button to fill screen and avoid text.

Simple menu - touch screen to select or use dial.

Deep Dive Menu -- push MENU button for 2 seconds.

Quick Menus - one push of MENU button

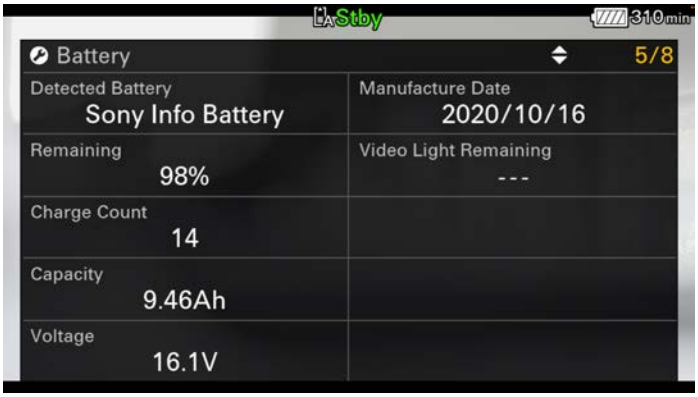
Project Settings.



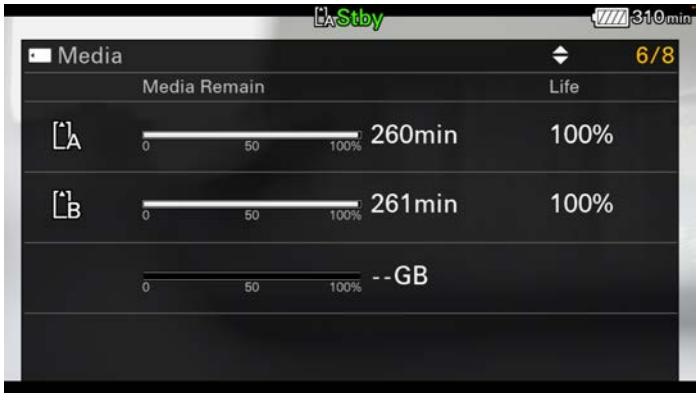
Audio Settings.

Monitoring Menu.

Assign user buttons here.



Battery Status



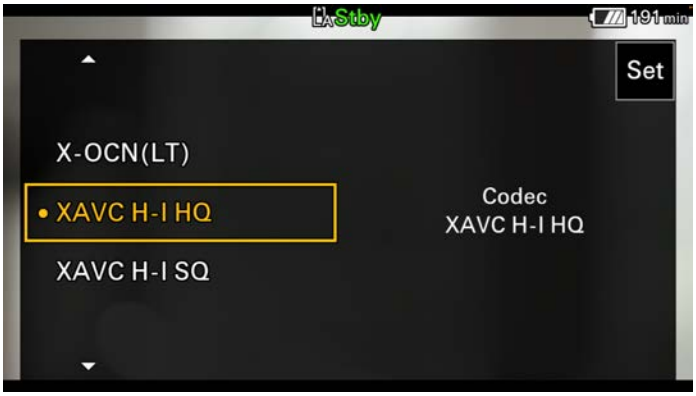
Media remaining.

Network, Wireless, Wired and USB status.

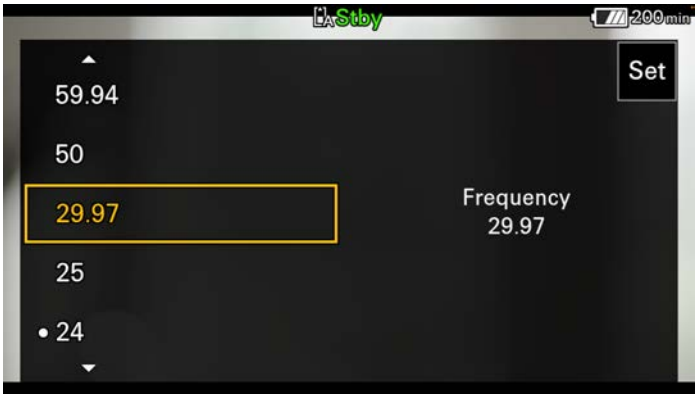
File Transfer status.

Quick Menu Setup

Project Menu set for Full Frame Cropped, 6K 17:9.

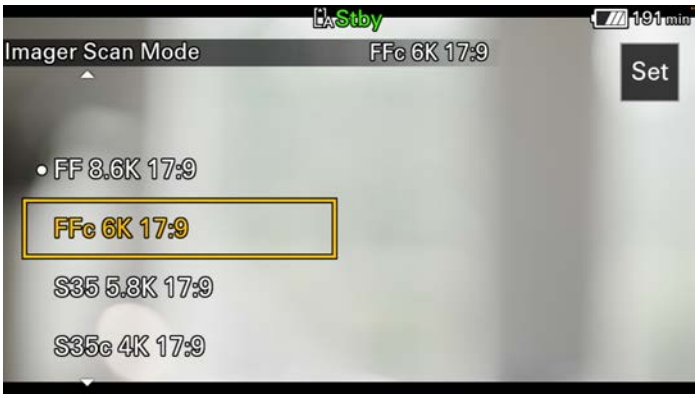


Select Codec: X-OCN (LT) or X-AVC-I HQ or X-AVC-I SQ.



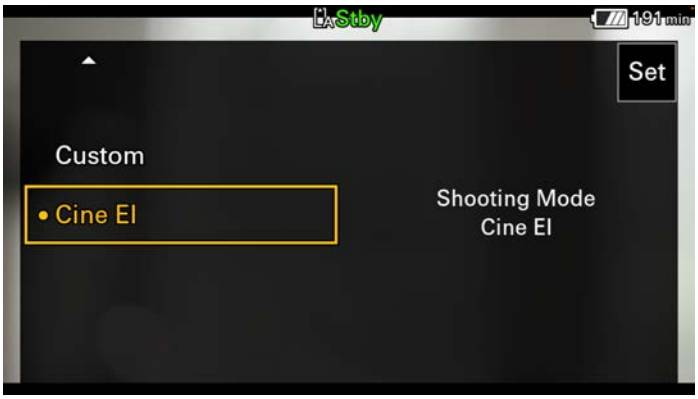
Frequency Scan is like the speed at which the footage is played back.

Imager Scan is the sensor resolution.



Resolution: Full Frame Cropped, 6K 17:9.

Shooting Mode: CINE EI or Custom.



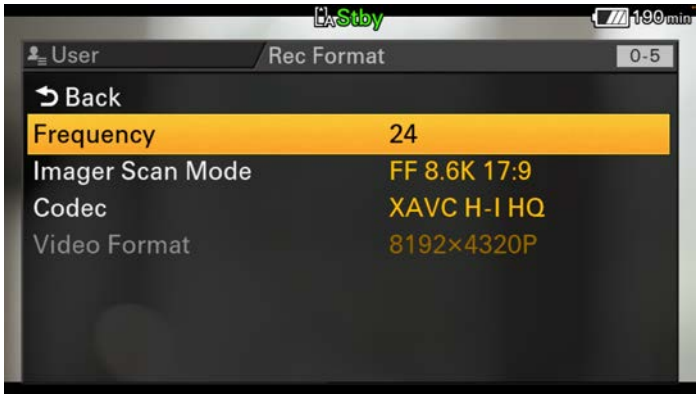
Video Format.

Deep Dive Menu

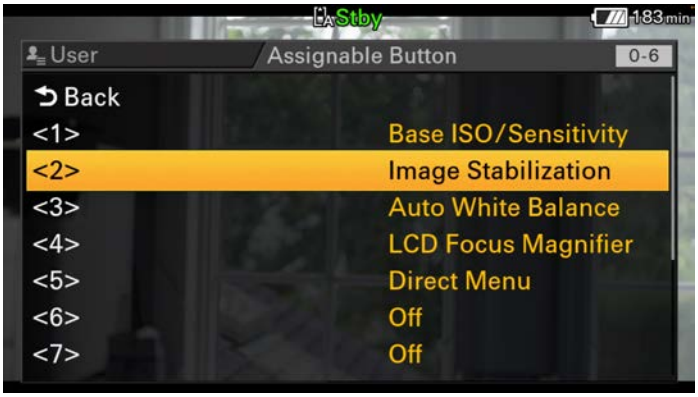
Deep diving begins with the User Menu.

Noise suppression OFF.

Image Stabilization: Yes please. We liked 3-axis with PL set to LOW, Auto. With E-mount lenses you can have up to 5-axis Steadishot.

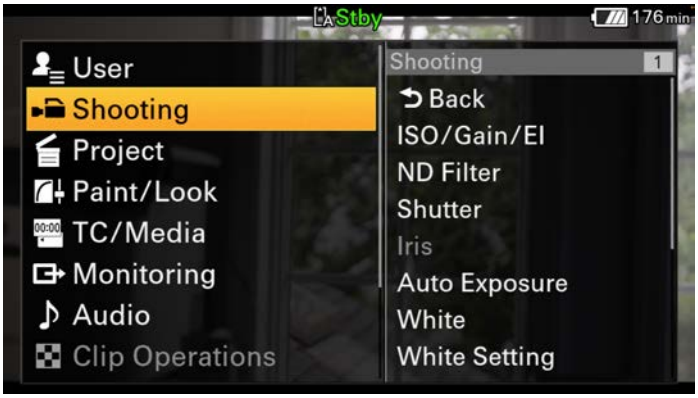


Recording Formats.



Assignable buttons are helpful. Use chart tape to identify on body.

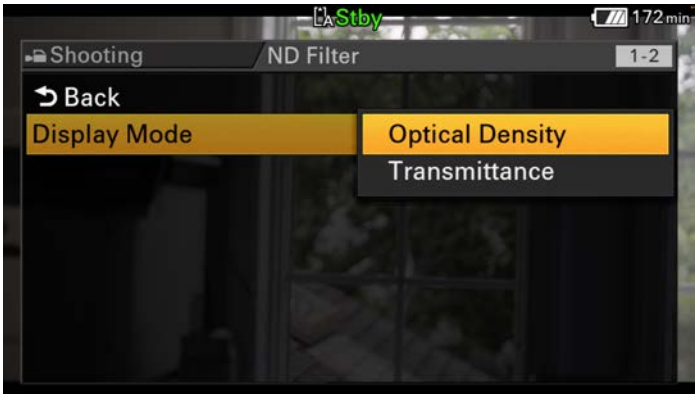
Focus Hold Button.



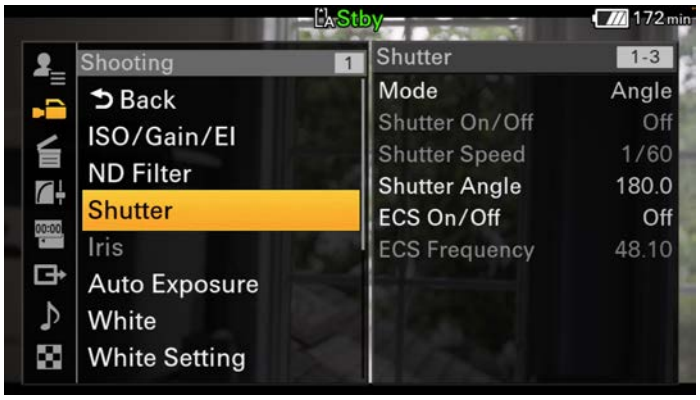
Shooting menu.

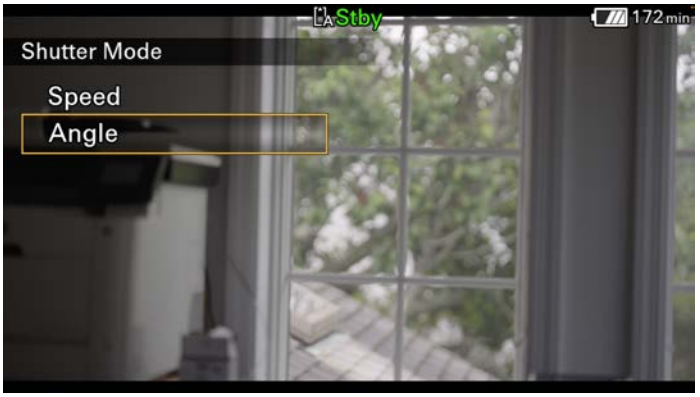
Base ISO of 800 or 3200. Shockless means smooth transition.

Deep Dive Menu

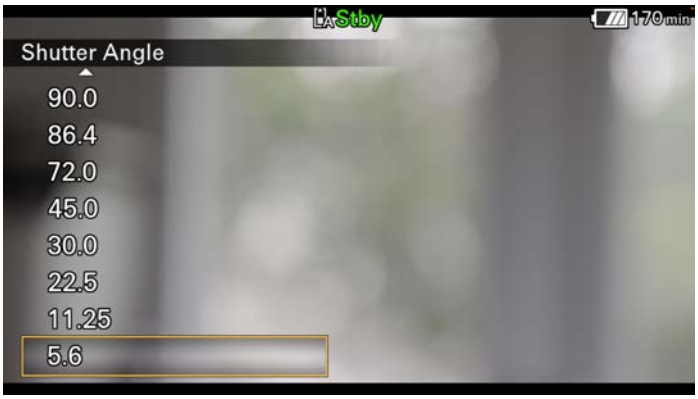


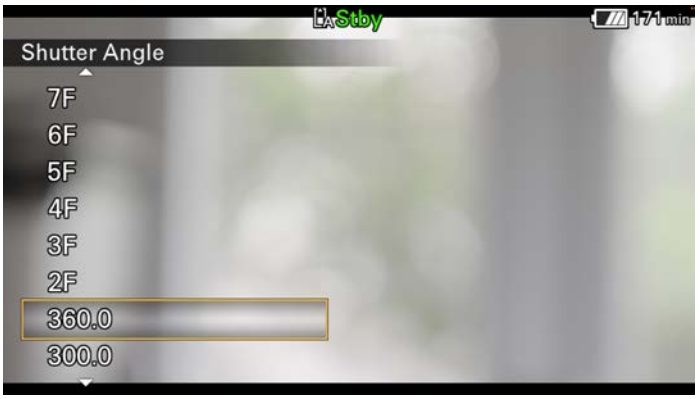
You can display the Variable Neutral Density values as Optical Density (ND.6, ND.9, etc.) or as Transmittance (1/4, 1/8, etc.)



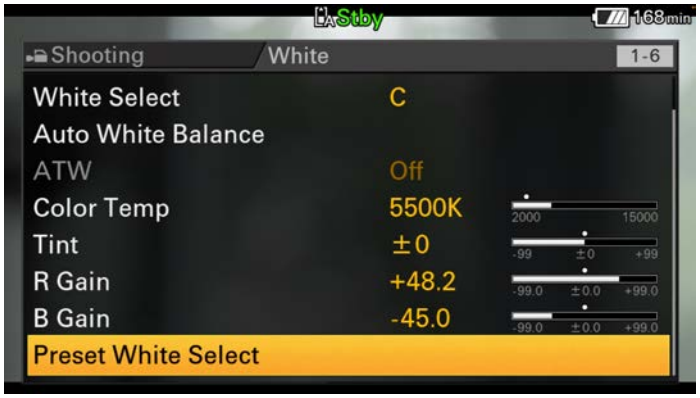


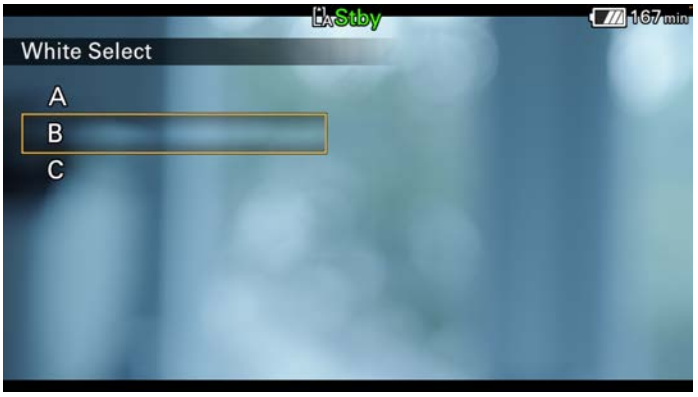
Shutter values can be displayed as shutter speed (1/60) or as shutter angle (180 degrees). I like shutter angle.





Shutter angles.



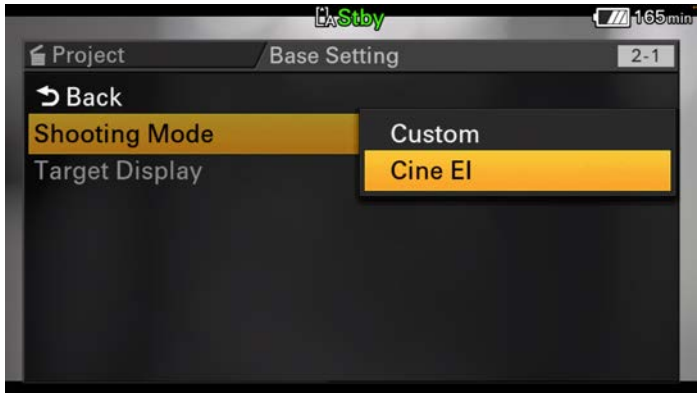


White Balance.

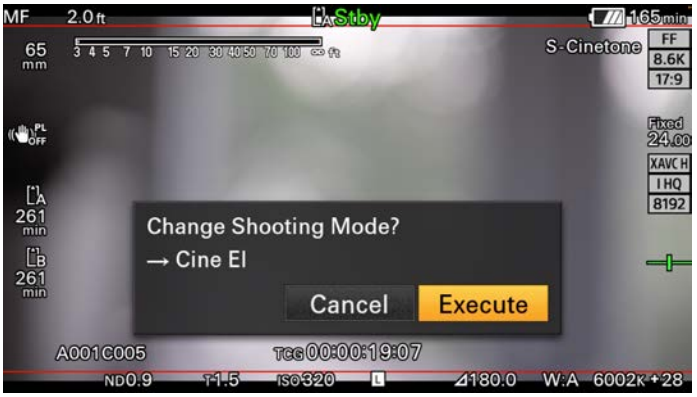
Deep Dive Menu

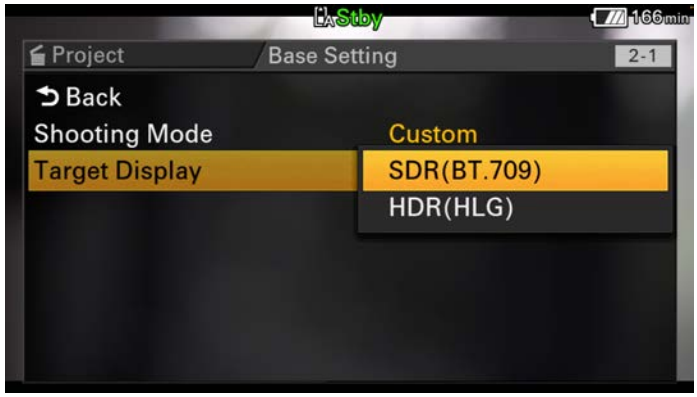
S&Q motion 1 fps - 30 fps in 8.6K. Enable with Setting: ON

Turn LUT displayed on Monitor or EVF to On or Off.



Shooting mode: Custom is the gateway to available LUTs.





SDR or HDR Displays.

Turn Interval Recording (Timelapse) on or off

Set Timelapse parameters: here, 1frame exposed every second.

Chris Schmid in Zambia

Chris Schmid zoomed in from his base in Morges, Switzerland. He described his short film A Day to Remember, *shot with BURANO:*

The main project was shot in Zambia in South Luangwa in Lower Zambezi National Park. *A Day to Remember* is a day in the life of a woman dreaming about wildlife. Zambia was an amazing place to shoot this film because you have a lot of ebony tree forests and it's very good to test the dynamic range of the sensor in the forest because you have a lot of different highlights and shadows.

For rigging the camera, I used a Bright Tangerine LeftField 3 baseplate. It was the same as the one for VENICE, thankfully. The optical center of the mount is the same for both VENICE and BURANO.

For lenses, the Canon CINE-SERVO 50-1000mm T5.0-8.9 PL was the main lens we used for wildlife scenes. All shots with the model were done with the DZOFilm Retro series.

Most of the footage of wildlife was shot in 50 and 60P. With the BURANO, to go 50P or 60P, you can shoot in either Full Frame 6K cropped or Super35 5.8K. 6K cropped is almost Full Frame. By playing between both formats, I could use the Full Frame expander of the 50-1000 or use the lens in its original Super35 format.

For my tripod, I used a Sachtler flowtech 100. But, most of the wildlife sequences were shot with a rig that attaches to the car door.

Most of the time, I was using the BURANO's PL mount. But then I was curious to test the camera with a Ronin RS3 Pro, to see if the weight worked or not. I'm happy to say that it works. All the moves with the Ronin RS3 Pro were shot with a Sony E-mount FE 24-70 mm F2.8 GM Full Frame G Master Zoom Lens.

We tried the autofocus because I thought it would be interesting. And it worked. Actually, you have a sequence with zebras, and we move past a tree in front of the zebra, but the focus remains on the zebra, so you don't lose focus.

The image stabilization was helpful too, especially with the Ronin. It removes small vibrations and was very useful.

I use BURANO's handgrip for the handheld shots of the model. All those handheld shots used image stabilization and internal Variable ND, which is also very nice, because for the first time you can combine both of them. So you have a lightweight kit and you can shoot wide open and with stabilization.

In wildlife filmmaking, the smallest crew is the best. There were only three of us: one guide, Melanie, the model, who was also working on location and shooting BTS, and me. That's how it works. We try not to disturb the animals. You don't want to be six people in cars. And even when you're filming from the cars, you're often filming with a focal length of 1000mm.

I used the SmallHD Cine 7 for the viewing monitor I didn't use the viewfinder with the eyepiece loupe, because I actually don't use a viewfinder—I prefer a larger monitor like the Cine 7. Even in bright sunlight, the display from the Cine 7 is very bright. I just used the small monitor from Sony for the Ronin shots so I could tap on the screen to manage the focus. That was the only occasion.

For slow motion footage of wildlife, it's usually 50P or 60P. We shot some sequences at 120P, 4K cropped, especially of birds and antelope running. But many people try to do too much slow motion. If you're shooting at 120 fps in wildlife, you need something moving really fast. You don't want an elephant at 120 fps. It doesn't make any sense.

Another really good feature is the cache recording. For a wildlife filmmaker, it's an essential. If you don't have cache recording, it's a nightmare because too often, when you push record, it's too late. Especially if you're waiting for animals, it doesn't make sense to record, record, record, because at the end there would be hours of footage that you don't need.

When I imported the files in DaVinci Resolve, it was very easy to grade the Sony X-OCN files. I just have an M1 Max Mac Studio and you can play the timeline in 4K in real time. It even worked smoothly with HDR Rec.2020. Also, the file sizes are very manageable. It's easy to back up files in the evening.

Danny Schmidt in Jackson Hole

Danny Schmidt is a director, producer, and cinematographer of documentaries. He was an early user of BURANO and reports:

As a freelance DP doing National Geographic films, wildlife and nature, it is important to have my own equipment because I'm also a gearhead.

The BURANO it's whatever you're going to make of it. You could certainly build it out with a VM tripod mount and a shoulder pad and make it an ENG style camera on your shoulder for docs. But you could have it small and modular like the FX6. So much of the time when I'm shooting docs handheld, I don't have the camera on my shoulder. I'm definitely not in an NBA game configuration.

What I like about the BURANO is that I could build it out, put it on my shoulder, shrink it down to shoot in other handheld ways. And then, of course, for wildlife filming, it's super easy to build out and put it on a big tripod. That's really what I was doing

Danny Schmidt in Jackson Hole

in Jackson Hole, Wyoming. Grand Teton National Park is right there. There's wildlife everywhere. It begs to be shot on sticks with a long lens. That was really what we did the most with that camera when we were there.

BURANO is especially effective on an Easyrig because this is just naturally where it goes. That's my good buddy Rick Smith, in the photo above, with BURANO on an Easyrig and a MoVi Pro. He's a DP and we work together all the time. We've traveled the world together.

There's something different about the autofocus on the BURANO. It is very smart and so fast. It was tracking elk as they moved in the beautiful landscape. They were not huge in the frame, and the autofocus would find them and just stay with them. I was reticent to adopt autofocus at first. Now, I love it, especially when I'm trying to track a moving subject. I love it in an interview setting when I want the camera to just be locked perfectly on an eyeball. There are times when I like to turn it off and just have that natural feel of a camera operator finding focus in a documentary, finding it and missing it.

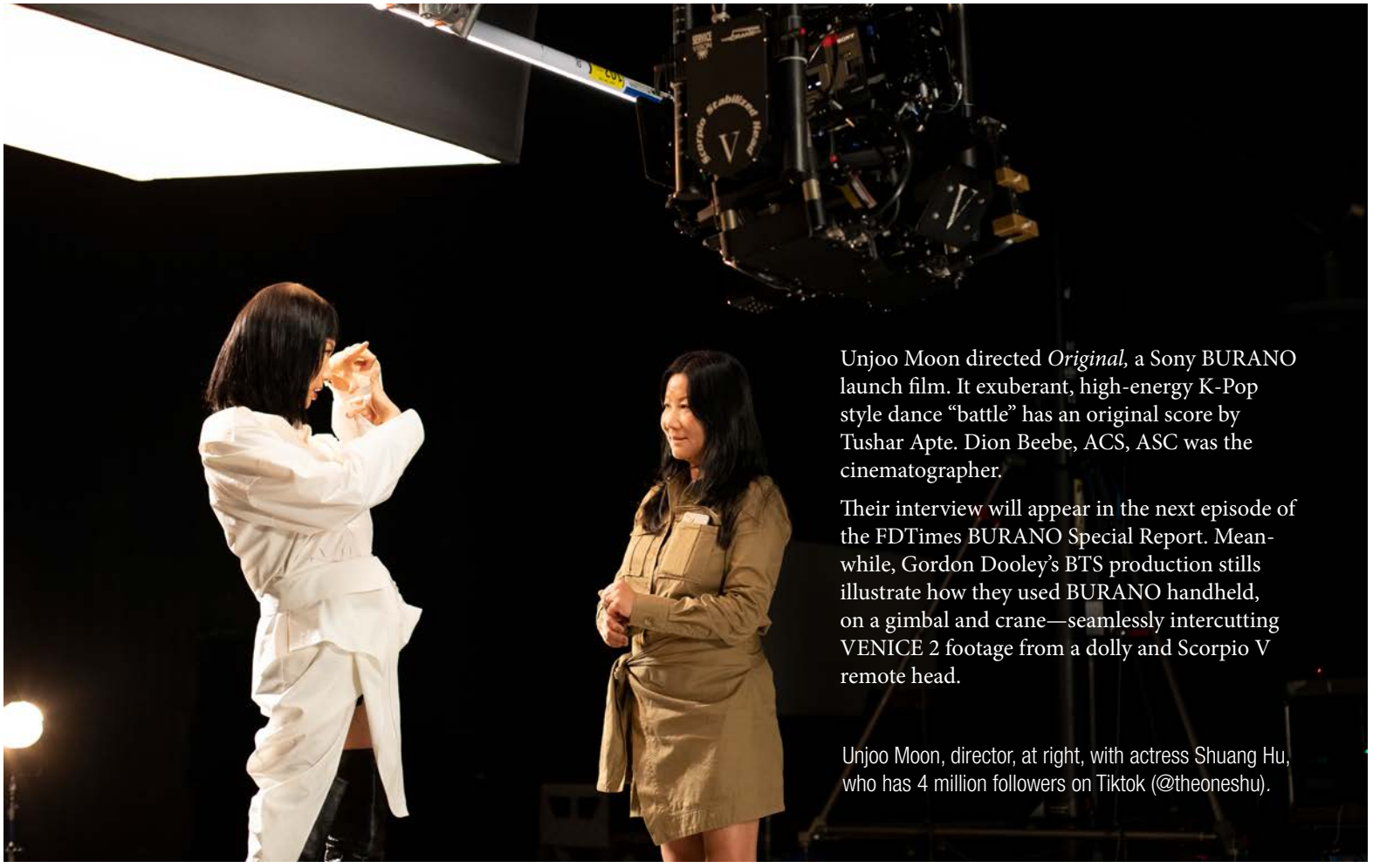
To tell it where to focus, on the built-in monitor/viewfinder, I would just tap the screen, it would lock, and then it's smart enough to know that's the thing it wants me to follow as it moves around.

The camera's IBIS was very interesting. I was able to work with that a lot. When you go into the menu of the BURANO, you can customize the lens stabilization. And so, with a PL lens, I could go in there and tell the camera that I'm shooting at 600mm. The camera then gets customized to be stable at that point, and not over-react.

I think BURANO is going to be a really cool opportunity for people who couldn't see themselves owning a VENICE or a VENICE 2 but would like to get into that space of camera quality, codec and sensor quality of the VENICE family at a price point that's more reasonable. It is a camera that I could actually envision owning. You don't want to own a camera that's not making money. So, I think this camera will be very much in demand for high-end documentaries. I think a lot of high-end docs will be shooting with BURANO, not just because of cost, but also because of its lighter weight, ergonomics and go-anywhere concept.

I think BURANO will be a good camera for owner-operators, especially in the wildlife and sports space.

Unjoo Moon & Dion Beebe, ACS, ASC on *Original*



Unjoo Moon directed *Original,* a Sony BURANO launch film. It exuberant, high-energy K-Pop style dance "battle" has an original score by Tushar Apte. Dion Beebe, ACS, ASC was the cinematographer.

Their interview will appear in the next episode of the FDTimes BURANO Special Report. Meanwhile, Gordon Dooley's BTS production stills illustrate how they used BURANO handheld, on a gimbal and crane—seamlessly intercutting VENICE 2 footage from a dolly and Scorpio V remote head.

Unjoo Moon, director, at right, with actress Shuang Hu, who has 4 million followers on Tiktok (@theoneshu).

Dion Beebe, ACS, ASC handheld with BURANO filming dancer Grant Kaita.

Photos: Gordon Dooley.

Unjoo Moon, director, at right, with actress Shuang Hu, who has 4 million followers on Tiktok (@theoneshu).

Dion Beebe with BURANO handheld
Photos: Gordon Dooley

Jenna Beltran filmed handheld by Dion Beebe, ACS, ASC with BURANO, SmallHD Cine 7 as viewfinder and Preston LR2W.

Stefan Duscio with BURANO in Melbourne

Stefan Duscio was one of the "test pilots" of Sony's new BURANO cine camera. His credits include Shantaram, The Dry, The Invisible Man, and many more features and commercials, music videos, shorts. He is based in Melbourne, Australia. Stefan said:

BURANO is two-thirds the size of a VENICE 2, and much lighter, with the same sense of quality. I thought, you're going to have difficulty stopping a film crew from wanting to use this on high-end sets. So I got my hands on a BURANO about three weeks ago.

Simon Williams, my First AC, took it to Southern Cross Cameras, a rental house in Sydney, and we figured out how to power the camera and accessories, how to rig it properly, how to run focus motors, etc. Out of the box, it wasn't set up to deal with all the accessories we normally use. Simon added a D-tap Splitter off the back of the camera to power his wireless lens controls, my monitor, video transmitter, focus measuring device and all the things that we normally hang on a camera. Remember, when other small cameras first came out in a similar way, we had all those head scratching issues as well and then third party manufacturers like Wooden Camera and others developed D-Boxes and additional units to put on the side of the camera to help with all those power issues. This just feels like similar scenario.

For our BURANO shoot, we were able to keep it pretty lean and small. We wanted to honor the intention of that camera. I had my own SHAPE handles. For low-angle shots, I used the Sony top handle. We used Canon K-35 primes, PL mount, and they looked really beautiful on that sensor. They covered Full Frame. We were in X-OCN LT 8.6K, framing for2:1 aspect ratio. We devised a loose narrative around a couple who had just committed a robbery and were hiding away in a motel.

To be continued: these BURANO user stories and more in an FDTimes Special BURANO Report.

BURANO's New LUTs

A few pages earlier, BURANO Product Planner Toshi Kanayama describes 4 new menu-selectable LUTs—called WARM, COOL, VINTAGE, and TEAL AND ORANGE. DP Tim Nagasawa test them with the new Angénieux EZ-3 zoom lens.

BURANO Cool, Angénieux EZ3

BURANO Teal and Orange, Angénieux EZ3

BURANO Vintage, Angénieux EZ3

BURANO Warm, Angénieux EZ3

BURANO Cool, Angénieux EZ3

BURANO Teal and Orange, Angénieux EZ3

BURANO Vintage, Angénieux EZ3

BURANO Warm, Angénieux EZ3

Angénieux Type EZ-1, EZ-2 and now EZ-3

EZ-1 EZ-2 EZ-3

Angénieux EZ Zoom Lenses made their debut at IBC 2016. Thousands have been delivered since.

They are convertible, affordable, compact zooms with rear modules that cover both Super35 and Full Frame formats. You see them flying on numerous Steadicam, gimbal and handheld setups.

The IRO (Interchangeable Rear Optics) module lets you use the same lens to swap between Full Frame format (up to 46.3mm image diagonal) and Super 35 (up to 30.4mm image diagonal).

By swapping the rear IRO (Interchangeable Rear Optics) module, the lens becomes a wider and faster Super35 zoom. You can configure the lenses easily for S35 and FF formats by swapping the rear group yourself.

- The Angénieux EZ-1 covers a middle zoom range. It arrived first.
- The Angénieux EZ-2 came next. It covers wider angles.
- And now we have the EZ-3 for longer focal lengths.

New Angénieux Type EZ-3

Camera Left Side

Full Frame IRO rear "module"
68-250mm T3.5-4.5

Main "body" of EZ-3 Zoom Lens
accepts the Full Frame IRO
or the Super35 IRO

Super35 IRO rear "module"
45-165mm T2.3-3.0

Camera Right Side

The new EZ-3 is even easier and faster to change from FF to S35 and back again thanks to a new, quick IRO technology mechanism. In fact, it takes less than 5 minutes and can be done on location.

Angénieux Type EZ-3, EZ-1 and EZ-2 Zooms

New EZ-3 Zoom Lenses

LONG

EZ-3
Super35
45-165mm
T2.3-3.0

EZ-3
Full Frame
68-250mm
T3.5-4.5

Angénieux EZ zoom lenses have full metal mechanical barrels with internal thermal drift compensation. In other words, your focus remains constant as temperatures on location fluctuate.

Focus, iris, and zoom rings have a familiar wide rotation and industry-standard 0.8M gear teeth.

The lens length remains constant because focus and zoom mechanisms are internal. EZ-3, as with EZ-1 and EZ-2 zooms, comes with PL mounts.

A large selection of other lens mounts is available from Angénieux (PL, EF, E, RF). They are interchangeable among EZ Zooms.

The IROs are not interchangeable between different lenses. They are factory claibrated and matched to each serial numbered lens.

Band Pro is the distributor in the Americas, Jebsen in China/Hong Kong, and Angénieux France in Europe and rest of the world, along with resellers.

angenieux.com
bandpro.com
jcinecast.jebsenconsumer.com

MEDIUM

EZ-1
Super35
30-90mm
T2.0

EZ-1
Full Frame
45-135mm
T3.0

WIDE

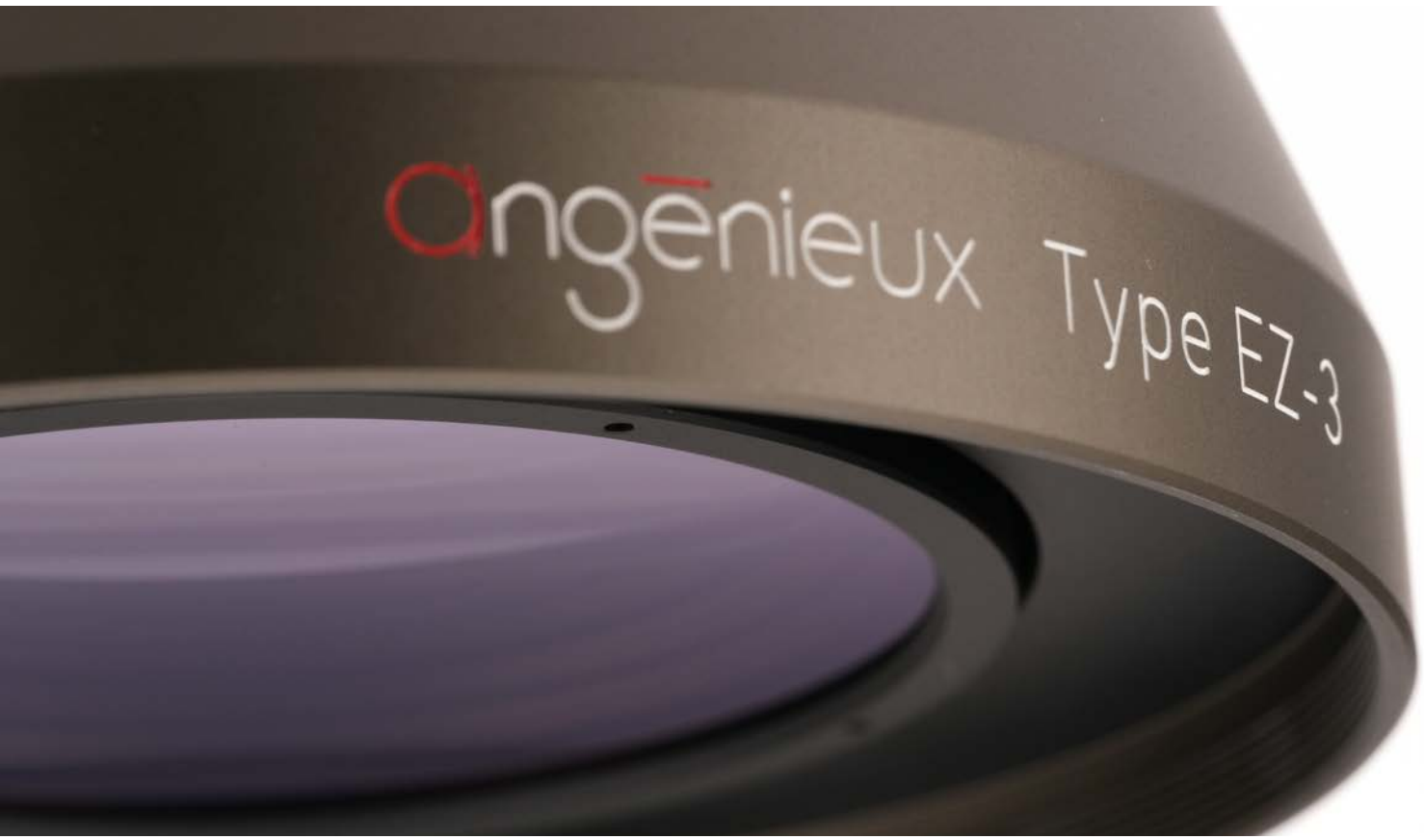
EZ-2
Super35
15-40mm
T2.0

EZ-2
Full Frame
22-60mm
T3.0

Angénieux Type EZ-1, EZ-2 and now EZ-3

	EZ-2		EZ-1		New EZ-3	
	Super35	Full Frame	Super35	Full Frame	Super35	Full Frame
Focal Length (mm)	**15-40**	**22-60**	**30-90**	**45-135**	**45-165**	**68-250**
T-Stop	2	3	2	3	2.3-3.0	3.5-4.5
MOD (m)	0.6m	0.6m	0.6m	0.6m	1.2m	1.2m
MOD (feet)	2’	2’	2’	2’	4’	4’
Image Circle Ø (mm)	30.4	46.3	30.4	46.3	30.4	46.3
Zoom ratio	2.7x	2.7x	3x	3x	3.7x	3.7x
Iris blades	9	9	9	9	9	9
Iris scale rotation	90°	90°	90°	90°	90°	90°
Focus scale rotation	310°	310°	310°	310°	310°	310°
Zoom scale rotation	90°	90°	90°	90°	90°	90°
Front diameter (mm)	114	114	114	114	114	114
Front filter thread (mm)	105	105	105	105	105	105
Length (mm)	210	210	226	226	265	265
Length (in)	8.3	8.3	8.9	8.9	10.4	10.4
Weight (g)	2,120	2,070	2,150	2,050	2,600	2,600
Weight (lb)	4.7	4.6	4.7	4.5	5.7	5.7

- Flange depth adjustment: Shims
- Lens Mounts available: PL, EF, E-mount, and RF — all lens mounts work interchangeably on all three EZ Zoom Lenses.
- Meta Data: None
- Servo Unit: Optional detachable zoom grip



Guillaume Dubois, Product Manager on Angénieux Type EZ-3 Zooms

Guillaume Dubois is a Product Manager of Cine Lenses at Angénieux. He joined the company in 2009 and worked in the production line as a process engineer, working on big lenses like the Optimo 24-290, Optimo 17-80 and Optimo Ultra 12x. He joined the design and industrialization team for the EZ-3. He graduated from the National School of Micro Mechanics: Supmicrotech ENSMM

Jon: It took me 5 minutes to swap the EZ-3 from Full Frame to Super35. Do I pass your test? I was worried because somebody told me it should be three minutes.

Guillaume: Five minutes is very good and realistic. I can do it in three minutes, but I have a lot of practice.

How did you come up with the EZ-3 concept?

We always start from our customers' needs. Therefore, it was natural to propose a tele lens after the "standard" EZ-1 and the wide angle EZ-2, to build a comprehensive lens series that would expand their possibilities.

Please tell us about the design.

The EZ-3 design started in 2021. In fact, it was pretty quick, considering that there was the design phase, the industrialization and the production ramp up.

How did you decide on the focal lengths?

Focal lengths of a zoom lens are always a matter of compromise. The idea was to optimize the lens for longest and widest practical focal lengths possible while also keeping the fundamentals of the EZ family: light weight and compatible with both Full Frame and Super35, with the same front diameter. We wanted to keep the same front diameter. EZ-3 had to be exquisitely complementary to EZ-1 and EZ-2 in terms of focal lengths.

But there's a bit of an overlap between the EZ-1 (45-135mm Full Frame) and the new EZ-3 (68-250)?

Ultimately, such a series is always a question of compromises. The idea was also that you could carry just two Type EZ Zooms if you wanted to travel light. You could take the EZ-2 (22-60 in FF) and the EZ-3 (68-250 in FF). You go from 22 to 60mm and then you jump 68 to 250mm, you're only missing eight focal lengths.

What were some of the other important things that you and the team wanted this new lens to have besides the focal lengths?

The new EZ-3 has the largest zoom range, at 3.7x. The range of the EZ-1 is 3x, and EZ-2 is 2.7x. We tried to optimize the range, knowing it is a tele lens. We had a lot of internal discussions, and we ended up saying that having a bigger range for the tele objective is a good idea, but keeping the lens at the same 114mm diameter as the EZ-1 and EZ-2 involved a choice we had to make. That choice allowed us to have controlled ramping on the tele side of the lens. There is a little bit of exposure ramping beyond 200 mm in Full Frame, but this is the price to pay to get that extra range. We spoke with our end users and they agreed it was a good option to go further knowing that they would have a little bit of ramping.

If you close down the aperture beyond a T4.5 in FF (3.5 is S35) there's no more ramping?

Correct. If you stop down past T4.5, you can do a full zoom of the entire range without any ramping. There's a line on the zoom scale that shows where ramping might occur.

Who are the intended users of the EZ-3?

For EZ-3 as well as EZ-1 and EZ-2, the intended market and users are independent filmmakers, but they are also very popular for applications such as Steadicam, news and documentaries. The EZ series, including the EZ-3, is for anyone who wants lightweight, cinestyle lenses with the best value for the money.

If you're a high-end DP renting from a high-end rental house and they have both the EZ-3 and the Optimo Compact zooms, what are the main differences?

The EZ zooms do not have the same type of mechanics and optics as the Optimo lenses. They also have different characteristics. For example, they do not have lens metadata. Also, they do not have the traditional Angénieux Optimo look.

In terms of overall performance, the EZ family is optimized to match with cameras from the same category, the so-called entry or mid level. Optimo lenses are made to match high-end cameras and production needs. So they have different specifications. In other words, we accept some compromises on EZ lenses that we would not make on Optimo lenses, but this is extremely well managed to offer them at the right price and quality level. EZ lenses are optimized for different optical frequencies. Also, they do not have the traditional Angénieux Optimo look. Having said that, their cinematic look is very much appreciated as well.

Please define the two different looks—Optimo and EZ.

The ingredients are a secret sauce :) The EZ lenses have a good

cinematic look, but not the traditional Angénieux look.

Do Optimos have smoother skin tones? And EZ zooms have less resolution and more geometric distortion?

Yes. Frequencies, distortion and resolution for sure. We are one step below the Optimo, otherwise they would cost the same price.

But even high-end DPs have been happy to use EZ-1 and E-2.

Yes because EZ lenses are good lenses and they have proved it. However, when they use them, it's usually because of the aperture or the fact that they were one of the only, very fast aperture Full Frame lenses on the market. They used EZs a lot before the Angénieux Optimo Ultra Compact zooms arrived. Or they use them for different applications—on stunts, car chases, scenes like that, and on Steadicam, gimbals, and handheld.

Good point. Dan Ming, camera assistant and God of Focus who did *News of the World*, was using EZ-1 and EZ-2 and he said they didn't seem as mechanically strong as the Optimos.

EZ lenses are robust lenses, but their mechanical construction is lighter. They do not have the Optimos' historical, rugged mechanical construction with stainless steel rods. EZs have a design that is lighter and smaller. When you buy an Optimo, you know that this lens will last for more than 10 or 20 years. EZ lenses are not made to last for so long, which is a reason why they cost much less. Having said that, EZs are still very good and we have a very limited amount of returns on them, even after more than five years of demanding use. If you buy your own EZ lens and if you take care of it, you can keep it for years and years as an owner operator or a rental company with in-house lens technicians.

What mounts are you offering? PL, E-mount, what else?

We have PL, E-mount, EF and RF.

Are you considering LPL?

No. There are many LPL to PL adapters available as accessories.

Can you please expand (not extend:) on the optical design?

We tried to optimize the number of optical lens elements and making compromise so this lens could be more affordable compared to an Optimo. But what is also very important is that on the EZ-3, the Full Frame and Super35 designs were also done in parallel, at the same time. It was not a Full Frame first, and then a speed-boosted Super35 lens. Furthermore, it was not Super35 lens with an expander. Every version was optimized as a complete lens set designed at the same time.

Many people still think that the EZs are essentially Super35 zooms with expanders.

No. That is not the case. None of our lenses that have IRO (Interchangeable Rear Optics) technology are lenses with an expander. They are fully designed from the beginning to integrate that IRO rear module for flexible format coverage with accompanying focal lengths and apertures.

That includes the Optimo Ultra 12X?

Absolutely. It's not a speed booster technology or an expander technology. They are two lens designs growing in parallel and every time we try to improve. That is the point of IRO technology to have two, fully complete zoom lenses. Basically the IRO technology is a full part of the original optical design and the optical calculations as a set. The IRO concept is a strength of Angénieux because it shows that our lenses are totally flexible and can change the image format size.

To reiterate: in terms of optical quality, I think it's important for people to understand that the EZ lens versus the Optimo is a good lens. It's just that the EZ lens is optimized for certain types of cameras, productions and budgets. It would be a nonsense to make an EZ lens that would be over-specified.

The EZ-3 also has a very easy way to switch from Imperial to Metric focus scales.

We have double scales—for feet and meters. You can simply remove the ring, flip it and you can switch from meters to feet in the same time as for the IRO's aperture and zoom scales. It takes less than five minutes. It's quite practical and that is just one of the new ideas that are on the EZ-3.

Can you swap the focus scale in three minutes?

I think so, yes. It's not a question of speed. Because of the IRO technology, you might swap from S35 to Full Frame every day if you want, but going from meters to feet probably will only happen when you're prepping the job with the lens.

And, you don't have to do it in a clean room?

No. All you need is a special tool that comes with the EZ-3 lens.

EZ-3 Full Frame to Super35 Swap

Converting EZ-3 from Full Frame to Super35 (and from S35 to FF) is super quick and much easier than EZ-1 and EZ-2. You can do it yourself in the back of a camera truck or prep bay.

You don't have to be in a clean room. But working on a camera cart in the middle of a windy desert or on deck at sea during a gale is not a good idea.

Pretty much the only tool you need is a magnetized Phillips Head #00 screwdriver. A Wiha 40010 Magnetizer Demagnetizer is also good investment. It costs less than $6.

The screws are tiny. Of course, you will keep them in a rear lens cap or small parts tray.

Note: the optical element of the rear IRO module protrudes from its metal barrel. So do not put it on a hard surface. Keep it protected by its rear cap.

The only things that swap are the rear IRO modules. The rest of the lens stays the same.

Iris and zoom scales will be adjusted. The Focus scale remains untouched unless you want to change from Imperial to Metric. You can flip the focus ring to change from Imperial to Metric readings, but we'll save those instructions for another episode.

To protect the rear IRO element, keep it in its protective metal cap (at right).

In the storyboard that follows, we show the rear IRO module without the cap for simplicity. The rear element was protected with lens tissue.

Step 1.

Unscrew the red ring of the FF IRO.

Full Frame EZ-3 68-250 T3.5-4.5.

Super35 EZ-3 rear IRO module makes the zoom a 45-165mm T2.5-3.0 lens.

Step 2.

Full Frame IRO that you just removed.

EZ-3 zoom lens.

S35 IRO waiting to be attached.

Step 3.

Peering down the barrel from the top, here's a view of the 9-bladed, rounded iris.

S35 IRO ready to be attached.

EZ-3 Full Frame to Super35 Swap

4.

S35 EZ-3 45-165mm T2.5-3.5 IRO is attached. Now, if this is the time "Between the dark and the daylight, When the night is beginning to lower," and you're scrambling for more magic hour exposure, you could begin shooting now —without changing the iris and focal length scales.

5.

Changing the iris scale is clever and quick. Remove 4 Phillips screws (just below the red ring) with a #00 magnetic screwdriver. Of course, you'll store them in the rear lens cap.

6.

Rotate the iris window barrel 180 degrees. Turn the iris ring to wide open. A paper clip helps to locate the correct position.
The new Super35 iris marks magically appear.
Secure with the 4 screws you previously removed.

7.

Next, we'll change the zoom scale from FF to S35.
As with the iris scale, all the numbers are pre-engraved on the same barrel, so it's just a matter of moving the window.

EZ-3 Full Frame to Super35 Swap

8.

The zoom barrel's rubber band has been moved up, revealing 3 sets of screw holes: lower for FF and upper for S35.

Remove the 3x Phillips screws from the bottom holes (FF format). If it's your lens, consider identifying the holes with thin P-Touch tape (below).

Use Phillips Head #00 screwdriver.

9.

Closeup showing how the Zoom window slides up to change from FF to S35.

10.

I fumbled at first, which led to using P-Touch 6mm wide clear/white tape to show which screw holes to use for Full Frame or Super35.

11.

Slide the rubber band back in place and you are now ready to roll in Super35.

Voilà.

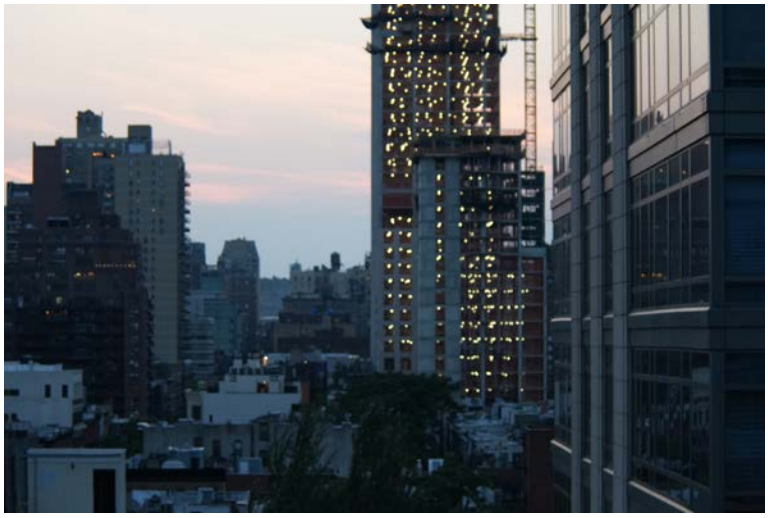
EZ-3 Multi Format S35 and FF

Super 35 EZ-3 on a Super35 sensor

S35 EZ-3 at 45mm, wide open on S35 sensor.

S35 EZ-3 at 165mm wide open on S35 sensor.

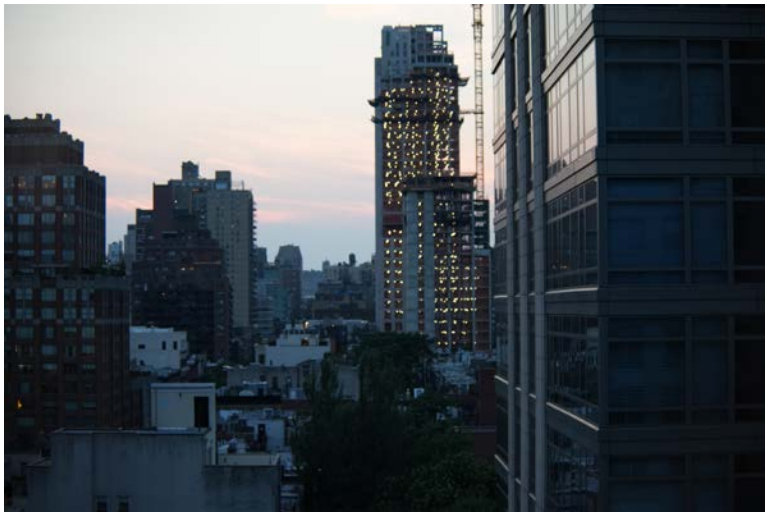
Full Frame EZ-3 on a Super35 sensor



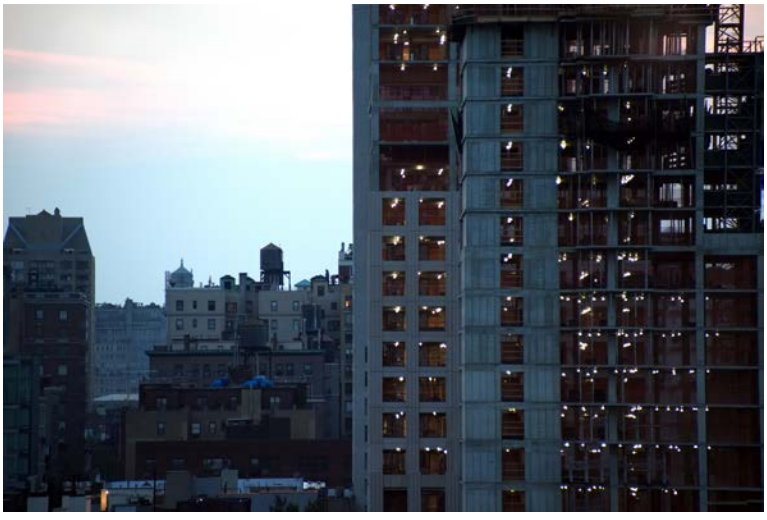
FF EZ-3 at 65mm on S35 sensor.

FF EZ-3 at 250mm on S35 sensor.

Full Frame EZ-3 on a Full Frame sensor



Full Frame EZ-3 at 65mm on FF sensor.



FF EZ-3 at 250mm on FF sensor.

A Timeline Look at Cooke Speed Panchros

Cooke Speed Panchro Series I, 35mm f/2.
Photo by Jon Fauer at Eastman House.

Cooke Speed Panchro Series II, 50mm f/2 (T2.3), c. 1945.
Photo courtesy of Cooke Optics Limited.

Cooke Panchro/i Classic, Super35. 25mm T2.2.

Cooke Panchro/i Classic, Full Frame. 25mm T2.2.

Cooke Speed Panchros have a prestigious provenance. The majority of feature films made in Hollywood during the first half of the 20th century were shot using Cooke lenses, and many of these were Panchros. Horace W. Lee designed the first Cooke Speed Panchro in 1921—a prime lens with a wide aperture for filming in low light.

In September 1926, Frank E. Carbutt, Director of Photography at Famous Players-Lasky Studios wrote, "These lenses have, without exception, given perfect satisfaction."

In July 1930, The British Journal of Photography wrote, "It deserves to be better realized in the photographic world to what extent Taylor-Hobson lenses have come into favour in the sound-film and silent-film studios in England and in Hollywood. The Cooke lenses of very large aperture have been establishing themselves increasingly in film production for several years past, and are now in use to an extent which is very gratifying to those knowing the merits of British products. In the same way Taylor-Hobson projection lenses have secured something like a monopoly among the 'super cinemas' in this country for projecting these same films. Frequenters of the movies may reckon therefore that most of the pictures which they see are both produced and projected by means of lenses made in the Leicester factories."

By 1935, Cooke Speed Panchros for cinematography were supplied in 8 focal lengths: 24, 28, 32, 35, 40, 50, 75 and 108 mm. They all covered the Standard 35mm 1.33:1 camera aperture of 0.631" x 0.868" / 22mm x 16mm.

In 1945, Cooke introduced the Speed Panchro Series II lens, designed by Gordon Cook. They had an anti-reflective coating and came in 6 focal lengths: 18, 25, 32, 40, 50 and 75 mm.

In 1959, Gordon Cook designed Cooke Telepanchro lenses to supplement the Speed Panchros: 152, 203, 318, 406 and 558 mm. They were supplied with basic focusing mounts ready to be adapted to popular cameras at the time: Arriflex, Éclair Cameflex, Mitchell and Newall.

April 2017. In response to enthusiasm from cinematographers and rental houses for rehoused Cooke Optics' vintage Speed Panchro lenses from the 1920s-1960s, Cooke introduced a new series of Panchro/i Classic Super35 lenses. In addition to modern mechanics, cam focus and PL lens mounts, they all cover Super35 image circles—approx. 30mm diagonal. (Original Panchros cover Standard 35 Academy format.) Panchro/i Classics have an expanded focus barrel with a front diameter of 110mm. Focal lengths are 18 , 21, 25, 27, 32, 40, 50, 65 Macro, 75, all T2.2—and 100mm T2.6, 135 T2.8, 152 mm T3.0.

The initial set of Panchro/i Classics covered S35. With Full Frame rising, Cooke introduced an entire set of Full Frame Panchro/i Classics with the same focal lengths and similar specifications.

New Cooke SP3

September 5, 2023. Cooke introduces a new line of compact, lightweight, mirrorless-mount, affordable lenses. The new Cooke SP3 primes are based on a reincarnation of the legendary Cooke Speed Panchros.

Tim Pugh, CEO at Cooke Optics, calls the SP3 lens series "a significant strategic move into an exciting new sector that expands the horizons for such an iconic brand."

- The new SP3 primes are based on original Speed Panchros.
- They have modern mechanics and a single optical coating.
- At launch, there are five SP3 primes: 25, 32, 50, 75 and 100 mm.
- They all cover Full Frame and have a T2.4 maximum aperture. The lens mount is easy to swap. You do not have to be a lens tech, nor do you need a clean room.
- SP3 will come in E-Mount and RF-Mount as standard (RF-Mount will follow shortly after launch and customers can receive them free of charge). L-Mount and M-Mount are available as accessories. M comes in early 2024.
- Focus scales are marked in both Imperial and Metric scales—no need to swap or flip.
- Cooke Look matches with Panchro/i Classic FF and S35.
- SP3 are small, lightweight and share the same focus and iris gear positions.
- There's a ¼-20 threaded lens support at the bottom.
- Peli-style case (next page) is included when you buy the complete set of 5 lenses.
- *cookeoptics.com*

Cooke SP3 Set of 5 Prime Lenses

Peli-style case is included with a complete set of 5 SP3 lenses.

Cooke SP3 Specs

Lens (focal length)	25mm	32mm	50mm	75mm	100mm
T-Stop range	T2.4 - T16	T2.4 - T16	T2.4 - T16	T2.4 - T16	T2.4 - T16
Angular rotation of iris scale	78°	78°	78°	78°	78°
Minimum marked object distance (MOD)	250 mm	350 mm	500 mm	800 mm	800 mm
	10 in	13 in	20 in	3 ft	3 ft
Close focus from lens front	139 mm	223 mm	394 mm	689 mm	663 mm
	5.5 in	8.8 in	15.5 in	27.1 in	26.1 in
Angular rotation to MOD end stop	160°	160°	160°	160°	160°
Length from front of lens to lens mount (E - Mount)	98 mm	94 mm	94 mm	98 mm	124 mm
	3.85 in	3.7 in	3.7 in	3.85 in	4.88 in
Maximum front diameter	64 mm	64 mm	64 mm	64 mm	82 mm
	2.52 in	2.52 in	2.52 in	2.52 in	3.22 in
Maximum diagonal angle of view for FF format	81°	69°	47°	32°	25°
Maximum diagonal angle of view for S35 format	62°	50°	34°	22°	17°
Total weight (with lens mount)	575 g	520 g	500 g	520 g	690 g
	1.27 lb	1.15 lb	1.10 lb	1.15 lb	1.52 lb
Screw-in filter	M58 x 0.75	M58 x 0.75	M58 x 0.75	M58 x 0.75	M77 x 0.75

Maximum format coverage:	Full Frame, optimized for coverage of 43.3mm
Focus scales:	Dual Focus non-linear scales - Imperial and Metric, scales marked from infinity to MOD.
Focus drive gear:	83 teeth 0.8 Metric Module.
Iris scales:	non-linear scale, marked in whole and 1/3 stops.
Iris drive gear:	83 teeth 0.8 Metric Module.
Mounts:	E-mount, RF Mount. L-Mount and M-Mount (coming early 2024) as accessories.

Danny Haikin on Cooke SP3

A 50mm prototype SP3 Cooke Look at Danny Haikin at T2.4 in the FDTimes office.

Danny Haikin, Chief Marketing Officer at Cooke Optics, visited FDTimes a few months ago. He did not come empty-handed nor would he relinquish his stylish briefcase. With exquisite suspense typically reserved for bank heists, spy stories or deliveries of large Alba truffles to finicky New York chefs, Danny proceeded to extract a prototype Cooke SP3 from his stylish briefcase. It was a lens, about the size of said truffle and possibly more affordable.

Jon: How did the idea for SP3 primes begin?

Danny: It was the idea of Kees Van Oostrum, ASC. He's talking to cinematographers and filmmakers all of the time, including quite a lot of film students. He had the idea for Cooke to do a set of short flange back prime lenses, with photographic mounts, broadly based on the venerable Speed Panchro. We then started trying to understand exactly how and where we could do that in the market.

We started researching what might be called the mid-market, which is hard to define because it does not neatly segment. So you really have to talk to people, theorize and extrapolate. Cine lenses are part a relatively small industry; you can't just learn the lens industry by buying a report. The mid-market is inhabited by owner-operators, and also some higher-end providers. It is growing very rapidly—partly due to the global desire for content and also the sheer quality of the camera hardware that's available. So we found that there was a tangible yearning for some more nuanced glass to sit on the end of those cameras.

Of course, if you're working inside Cooke, which is such an interesting and stimulating company, you want to create a broader brand and a broader platform because you want more creatives to be part of it. All of these things came together and we decided to make the new Cooke SP3 lens series to be at the top of that mid-segment market. Furthermore, it is possible that these SP3 lenses would also be the most expensive in that segment. I think it would have been a bit strange if Cooke had made something inexpensive. But, from our point of view, it is 1/10th the cost of some of our other lenses.

Are these SP3s for still photographers or cinematographers?

One of the initial thoughts was that it could be partly for stills. But, on further reflection, we decided that it really needed to be fundamentally a cine product that would also be embraced by high-end still photographers. Though there is a nascent market for hybrid lenses, it needs to be fundamentally about cine because that's pretty much what all of our customers do—owner-operators, resellers and renters of cine equipment, not photographic equipment. But as you know, the SP3 takes very beautiful photographs.

When did this idea first take root?

The actual, formal NPD (New Product Development) process started just over two years ago.

That's like warp speed for Cooke or almost any cine lens.

It depends on the nature of the lens. The objectives of SP3 were very clear. It's a lens with an optical design that we have been using for a hundred years. The original Speed Panchro concept is very familiar. We have Panchro Classics in our series of lenses already—Full Frame and S35. The SP3 mechanics are all new

Cooke SP3 with RF-Mount on RED KOMODO-X

because it's a smaller and simpler design than our much larger PL lenses. But yes, the S8, by comparison, took over four or five years. That's not necessarily actual development time—but rather, thinking and understanding what the flagship product should do.

How did the SP3 concept evolve?

We quickly created a design and a three-dimensional model. Because the SP3 is so much smaller, it needed a design that was going to work both ergonomically and cosmetically. Then we started talking to customers to get their reactions. That's always interesting because your customers always have very useful opinions. I don't think you can go to a customer with a blank sheet and say, "What should we do?" But, if you bring them something that's partly formed, you get interesting ideas.

What parts of the market do these lenses address?

They are unashamedly for somebody who wants to create a look. Obviously, it's a Cooke lens, so it has the Cooke Look. It's the difference between just shooting things and shooting with style, which is what these lenses are designed to enable. We spent a lot of time talking to cinematographers: those who use Cooke lenses, others who only used them occasionally, and also those who had (gasp) never, ever tried a Cooke lens.

The techniques that cinematographers use to create drama and visual narrative are not always obvious, nor is the contribution that the hardware makes specifically, along with the actual person who uses it. A lot of our focus was to understand what segment of the middle market was using lenses creatively in their work.

Certainly, there is a much larger group of people who make perfectly nice factual productions, reality shows, documentaries or corporate videos that look entirely professional, do not intend to introduce any visual drama, and would not require a Cooke lens. SP3 may not be for that filmmaker. Or maybe it could be a turning point in these types of shows—an aspirational introduction into the world of the Cooke Look and how the attributes of the lens relate to creating a visual narrative that is the stuff of cinema as opposed to the stuff of factual image gathering.

Are you concerned that SP3 might hurt sales of Cooke high-end lenses?

No, they define different universes. SP3 come in E, RF, M, L and other short flange back mounts. The rest of the Cooke series of lenses come in PL mount. Many cinematographers like small lenses on small cameras because they're nimble, and that's part of their view of the world. And I've met people who will only shoot on a camera with a PL mount and that will be their belief to the end of their days.

Do SP3 primes match ever-popular vintage Speed Panchros?

They match Cooke Panchro Classic very well. When we talk about actual vintage Speed Panchros, they were, of cours,e made for many decades and vary a good deal. They certainly exhibit very similar imaging characteristics. We believe there will be a market for cinematographers using the SP3 series on B, C and D cameras.

How did you decide what mounts SP3 would come in?

That's an interesting question. We partly did that by market share, and by what we think our customers use. SP3 will come in E-mount at launch. RF Mount will follow shortly after launch and customers can receive them free of charge when buying a set. L-Mount and M-Mounch will be available as accessories, with M comeing in early 2024. Users can easily change the mount themselves.

Do people have to buy the whole set or can they buy the lenses individually?

You can buy the lenses one by one, or you can buy them as a set of lenses that come in a nice, free Peli-style case.

Looks with Cooke SP3

Looks: Jon Fauer, FDTimes

Looks with Cooke SP3

Kees van Oostrum, ASC on SP3

Kees van Oostrum, ASC is an award-winning cinematographer, President of the American Society of Cinematographers from 2016-2020 and currently the Non-Executive Chairman at Cooke. This fall, he is teaching cinematography in Shanghai.

Jon: How did you get the idea for SP3 primes?

Kees: As a student myself and now teaching, I found a tremendous interest in Cooke lenses and particularly the Speed Panchros. The idea was to create an affordable entry-level Cooke lens based on the Panchro Classic.

How did you get Cooke interested in going where they never went before? Or maybe they did, a long time ago.

Cooke at one point considered a still lens version of the S4 mini, but it was basically designed for the PL mount. But this concept was essentially for short flange back, mirrorless mounts.

The overall lens market is expanding tremendously in the so-called "prosumer market." Cooke anticipated that it could service this market with a unique Cooke lens product that features the Cooke look—but in a simplified mechanical version. Optically, this is the successor to the Cooke Panchro Classic and the rebirth of the original Speed Panchro.

The main thing you sometimes encounter in the original Speed Panchros that are from anywhere between the 1920s to 1940s, is that the image is yellowish because the coatings faded over time. But that can be corrected in grading. The initial concept was a set of lenses from Cooke that would be made available to the prosumer. The decision was to go with the Speed Panchro design because it is

SP3 on Ronin 4D

different from anything else out there. It is the Classic Cooke Look, which is something that's unique and that nobody else really offers.

How did the project evolve?

The initial design, both optical and mechanical, was with simplicity as a main motivator, but at the same time being considerate of optimum optical performance in a compact and robust lens. It features the adaptability to many still camera mounts, including Leica M. I was adamant about the M mount because, as a Leica fanatic, my memory went back to the days when Cooke actually produced lenses for the Leica M. These Cooke Speed Panchros for Leica M cameras have become very scarce, so in some ways it is again possible to marry your Leica M with the classic Cooke look.

Where are these lenses are going?

I think the SP3 lenses will find a quick acceptance in the high-end professional market as their compact form will bring the Cooke lens to the world of gimbals, drones and handheld applications.

One reason why the SP3 is so compact is that its focus barrel rotates 180°, rather than 240° as we have on our other cine lenses. Also, the original Cooke Speed Panchro has a design that moves the entire optics to focus. Unlike many modern lenses, where only some internal elements move forwards and backwards to focus, this is a very simple lens in the sense that all the elements move together, internally, within a very compact circumference.

Why does the focus barrel have a wider gear ring.

The focus gear ring is wider than the iris ring because it feels better to focus by hand like a photo lens. It is also a matter of design. It looks good. Also, when you work with smaller lenses, you very quickly run into questions of where to mount a lens motor and mattebox. And if you focus by hand, sometimes you don't know if you're focusing the iris ring or the focus ring. Now, you can feel the focus ring right away.

Did you think of the SP3 originally as a still lens or was it always planned as a cine lens?

I called it a still lens at the inception because I wanted to force the team away from cinema. But it's really a hybrid. It is a lens that is designed for shooting moving pictures. And at the same time, I also wanted it to be a lens that you could use on a still camera. Cooke already has some customers who buy S4 lenses to use on their still cameras because they want the Cooke Look. So in some sense, yes, SP3 primes are for some people who want to use them as still photography lenses.

Graham Cassely, Optical Designer, Cooke SP3

Jon: Let's get to the heart of the SP3 lenses. What does "based on Speed Panchros" mean?

Graham Cassely: When we started on the Panchro/i Classic project about 8 or more years ago, we did a lot of digging through lots of paperwork at Cooke to find the original Speed Panchro designs. We found the old prescriptions—the optical designs written down by hand. We couldn't just use them straight away because a lot of the old glass types they were using back then are not available anymore. We had to tweak the designs to get them to work with modern glass. We gained a lot of experience replicating the original Speed Panchro look. And we did that again a few years later, scaling them up as the Panchro/i Classic Full Frame primes.

The SP3 series are essentially another variation of the Speed Panchro design. In terms of the look of the lens, we tried to keep it very similar to what a Speed Panchro or a Panchro/i Classic would look like. We're using the same types of single layer coatings that they would have used back in the 50s or 60s—rather than the multi-layer coatings of modern lenses which are more efficient at reducing reflections. We also wanted some of that blue-purple flare that you get from those old coatings. And we did a lot of work just to make the designs as compact as possible, because we wanted the SP3s to be small.

For maybe the four people in the world who don't know the Speed Panchro, could you please explain?

Cooke built Speed Panchro cine lenses from the 1920s through 1960s. A majority of the classic Hollywood films from that era used them. With the advent of digital cameras, a lot of people are going back to these old lenses because they "take the edge off" that digital look and give you a more forgiving image, which is why we brought back the Panchro/i Classics to give the same kind of feel.

Did Cooke change the Speed Panchro designs or parameters from the 1920s through the 60s? I guess they did not even have anti-reflection coatings in the 20s and 30s?

The original Series I Speed Panchros didn't have coatings. The new Panchro/i Classics and SP3s are based more on Series-II Speed Panchros. When people think of Speed Panchros, they're usually thinking of Series II and Series III.

SP3 were specifically designed for shorter flange focal depth (FFD) mirrorless cameras?

Yes. E-mount (18mm FFD), RF (20mm FFD), L (20mm) and M (27.8mm FFD). You cannot use them on PL mount (52mm FFD) cameras. For PL, you might as well use our Panchro/i Classic.

Why do SP3 primes have wider rear elements than original Speed Panchros?

Some Speed Panchros had very short distances between the back of the glass and the film plane. The 32mm and 40mm Speed Panchro have a tiny diameter glass at the back, which is how they clear a spinning mirror film camera. The SP3 has a bigger rear element at the back because we designed for digital sensors and tried to make the telecentricity a bit better. Telecentricity is about the angle of the light coming out of the back of the lens. If the rear element is too small, then you're going to have a wider angle going out to the corners of your image. If you have a bigger rear element, you can make it a bit more gentle, which is preferable for digital sensors.

Please describe the particular look, the Cooke Look, of the Speed Panchro, the Panchro/i Classic, and now the SP3?

The lens designs allow for high-order aberrations. When you achieve the right balance, they provide a lower contrast look. The lenses resolve fine detail well but their lower contrast allows them to appear slightly softer, gentler. This is because we often perceive low contrast images as being less sharp than high contrast ones. The single layer coatings, being less efficient than more modern coating designs, also contribute to a lowering of the contrast of the image because you have more stray light.

What of our obsessive talk about fall-off towards the edges?

That is part of the look—how the image changes from the center to the edge and how you perceive it. When they were designing the original Speed Panchros, they didn't have electronic computers. It was all done by hand. In optical design terms, the primary aberrations were pretty well corrected, but the high-order aberrations were less well corrected. That's what gives you the low contrast look and the fall-off from the center to the edges of the image.

Cooke had rooms full of people who were called "computers"—mostly ladies, doing the math and working with logarithmic tables, tracing rays of light from one optical surface to the next through the lens. That's where the high-order aberrations came in. They didn't have the computing power to correct them all. But, it turned out that the images looked beautiful.

When I first started at Cooke, there was a lady named Pat Kelly working in optical design. She was one of the "computers" at Taylor Hobson, doing the math by hand. After Cooke bought their first electronic computer, she switched to that. It was the size of a room. These calculations are things that I can now see in my desktop software at the click of a button.

Please talk about the SP3 mechanical design.

We've done a few things to get the lens into such a small package. If you look at a Panchro/i Classic, the iris will go down to T22. SP3 goes down to T16. Also, in the Panchro/i Classic the iris is linear, so you have an equal distance between the marks for each stop. As you stop down an SP3, the distance between each stop gets closer together, which allows you to reduce the diameter of the whole lens. As for focus, to reduce the size of the SP3, the angle of rotation is 160 degrees compared to 270 degrees on the Panchro/i Classic. Also, the SP3s don't have /i or any electronics, so that's another weight and space saver.

How did you become one of the optical designers of SP3?

I'm from Leicester. Believe it or not, I'd never heard of Cooke while growing up. My degree is in mechanical engineering. After I finished university, I got a job at Cooke as a process engineer doing work on coatings and aspheric production. Then, Mark Gerchman, one of the optical designers at the time, needed someone to do some number crunching and I got more and more into the optics side of things. Around 2010, I got a Master's degree (MSc) in Optics at Imperial College, London. Cooke paid for it, which was amazing. I've been an optical designer here ever since.

We're really happy with the SP3. The size was a big driver for what we were trying to achieve. The look of the SP3 is what we were aiming for. It's very Speed Panchro. It's all about the Cooke magic.

Michel Suissa is Managing Director at The Studio B&H. He has a BS Degree in Applied Mathematics and Film/Video from Ecole des Arts et Techniques in Paris. Before B&H, Michel was Manager at Tape House (where we first met), and then worked as a Director / Creative Director in advertising and VFX.

Let's start with the big picture. In the cine equipment market up to now, we have mainly had a high-end and an entry level.

The middle market had been shunned by almost everyone until recently. But now, the middle market seems to be gaining interest. That's the evolution of the DSLR market which started something it could not complete. The arrival of mirrorless interchangeable lens cameras really unshackled that market. For the longest time, no substantial lens manufacturers paid attention to the mirrorless market, except the folks who were in the still photography business. That became by default the source for most mirrorless camera lenses.

You could take great pictures, super high resolution, and you can do 4K video. With Sony, the E-mount made it very easy to adapt any other lens to it. And then, you started seeing dedicated video cameras with this concept: Sony FS7 and the FS7 mark II, then the FS5, then the FX 9, 6, 3 and 30. RED recently introduced KOMODO and KOMODO X. That market has so much presence now, it cannot be ignored anymore.

It's not just these cameras working alone. It's also about these cameras as potentially the B, C, D cameras and the crash cams that go along with the A cameras on larger productions. That forced people to pay attention.

Why is it that Cooke is basically first to market with the SP3 series: mirrorless, short flange back, operated manually without electronics, with multiple mounts, and affordable?

I think some manufacturers had a quick foray into cinema lenses and it wasn't very successful because the market at the time was very selective, and then other manufacturers came in with decent products. These products wanted to be cinema lenses because there was a need for credibility and need for acceptance.

The reason why other manufacturers have not done what Cooke has done is because they were too busy asking whether they needed to enter the cinema market. That left room for newcomers to enter the market. Folks like Venus Optics, DZO, Viltrox, NISI and others started shaking the established conventions on affordable cinema lenses. Cooke was already in the cinema market, so they had to diversify, they didn't need to enter by the gray door. The gray door was already wide open. Who doesn't know Cooke in the cinema world unless you've been hiding under a rock for 100 years. For Cooke, it was like, how do we diversify by entering a market we've never been in before?

This could probably be the start of a new trend where big-time cinema lens manufacturers are entering a mid-range market, and I think that's likely going to turn some heads. There are probably some people in product development rooms wondering why they hadn't thought of that before? To be fair, some did, including Leitz with their M 0.8 lenses, ZEISS with their CP.3 series, and Angénieux with EZ Zooms.

There's an entire audience already knows Cooke well.

They already know the brand. And then there's another larger audience who will want to know more about Cooke, the brand that all these incredible filmmakers and cinematographers have used for a very long time. And now, all of a sudden, you can have that quality of lensing with your mirrorless camera or your small form factor video camera. It's clear that people will look at optics in the middle market in a different way.

The middle market.

The middle market is the fastest growing one in our business: with corporate films, educational, documentaries, indies, travel, how-to. It's a vast market and let's just say that it's under-explored and also under-recognized.

It's under-explored because a lot of manufacturers who should pay attention to a market that is probably the fastest growing one in our industry have not been paying as much attention. It's under-recognized because people in the high end of our industry have a tendency of saying, okay that's for certain projects, but not for the real projects. More often than not, you would realize that on these "real" projects there is a place for these cameras and lenses that actually serve an incredible purpose, even in the high end.

It's strange that the middle market has been slightly looked down

upon by some people, as opposed to being recognized as a major force. I think B&H has recognized that it's a major force in the marketplace, and we've serviced that market diligently.

Historically, the middle market has been around and has been very successful. Canon's launch of the C300 in 2010 at Paramount Studios was incredible. And then Sony introduced the FS7 and FS7 Mark II, and the FS5. Tens of thousands of these mid-level cameras were delivered.

These cameras became the workhorses of large segments of the industry. Even the broadcasters started using them for ENG reporting. It was incredible. All of a sudden, they could put a smaller team and send them in reporting out, and find some really interesting subject matter to cover that didn't require an OB-van. All of a sudden, the concept of ENG teams in the field became very different.

The FS7 and FS5 entered this market by promoting the Super 35 digital cinema look, with shallow depth of field, and everything else. All of a sudden, it was taking our industry by storm. And then a few years later, all of a sudden, the new flavors were Full Frame sensors. So, Sony came out with the FX9, FX6 Full Frame sensor cameras. There was real demand because originally, the hybrid cameras, the DSLRs and mirrorless cameras, had Full Frame sensors—larger than Super 35. Some of them were APS-C, but a lot of the Sony Alphas were very, very popular, and they were Full Frame. I think Sony really understood that market. And I think that's the market study that Cooke was pretty smart about. They realized who uses what and for what kind of projects.

Hats off to Cooke. I wasn't expecting what they have done with SP3. They seemed to be always living on the very high end. You wanted high-end anamorphics, it's Cooke. You wanted a high-end cinema prime, it's Cooke and the Cooke look. Up until the SP3 introduction, if you wanted a relatively affordable Cooke prime, you could order the mini S4/i PL primes for around $7,650 for each of the standard ones. But the "real" Cooke lenses were priced 3 to 4 or more times that and were intended more for the rental houses than for owner operators.

The team at Cooke seems proud to say, "Yes, we are entering this new market with a bang, we're going to enter with products that we love, and we hope to change people's mindset about how to use lenses on small to medium sized cameras. That's a very smart way to expand your market and your horizon, which can only go so high at some point. You have to look at what's a little bit below your comfort zone, and ask, "How do I manage to broaden my audience, broaden my customer base?" It's commendable that they've thought about it and they put a lot of resources into it.

If you are Michel Suissa running the Studio at B&H, are you worried that this will cannibalize or hurt your high-end Cooke sales?

Not at all. In fact, I'm very happy to be able to offer products that complement the high end, that could actually work together in complete synergy. In the beginning, the customers will be a mix of higher-caliber owner-operators and the traditional camera rental houses.

I would be very surprised if camera rental houses are letting themselves be bypassed by the Owner Operator Market. Based on the requests that I receive from camera rental houses, they often need other lenses than the high end.

Sur Mesure and Prêt-à-Porter.

It's almost like the fashion business where you have Sur Mesure, the custom-made line, and Prêt-à-Porter, ready-made, from the same company. Or, if you want something very high end, you go to their salon for a fitting. That's haute couture. The good analogy is that all these very high-end fashion and car brands have product lines are attainable by regular people. As opposed to being detrimental to their brand image, it is contributing to the sense of aspiration and being able to obtain it. These days, you can spend a fortune on a fancy BMW, or you can buy a small one for a descent amount and away you go.

The SP3 lens series is a product that Cooke has not built before. It's a build it and they will come approach. But the result of the lenses, what these lenses are actually going to capture, does exist. It has existed for a very long time. That Cooke Look is not something that's new. It's something that's been present in the cinema market for a very long time. So, yes they're going to build something so people will come to use what they have already seen before. It creates a sense of aspiration into the middle marketplace.

Swapping SP3 Lens Mount: E, RF, M, L

1.

Cooke SP3 lenses will come in E, RF, M and L Mounts. Additional short flange to sensor mounts may follow. You can swap these mounts yourself.

Of course, you have a Duclos Precision Driver Set with magnetic bits.

2.

This is an E-mount. Remove 4x Torx #5 or #6 screws.

3.

Remove the E-mount and carefully extract the shims.

4.

Remove 4x Hex 2mm screws from spacer ring.

5.

L-R: RF Mount with spacer, Lens, E-mount spacer, shim, E-mount.

6.

RF Mount has a wide inside diameter—no need to separate its spacer.

7.

Attach RF Mount and its spacer with 4x Torx screws (#5 or #6).

8.

Flange Depth of RF Mount is 20mm. E-mount is 18mm.

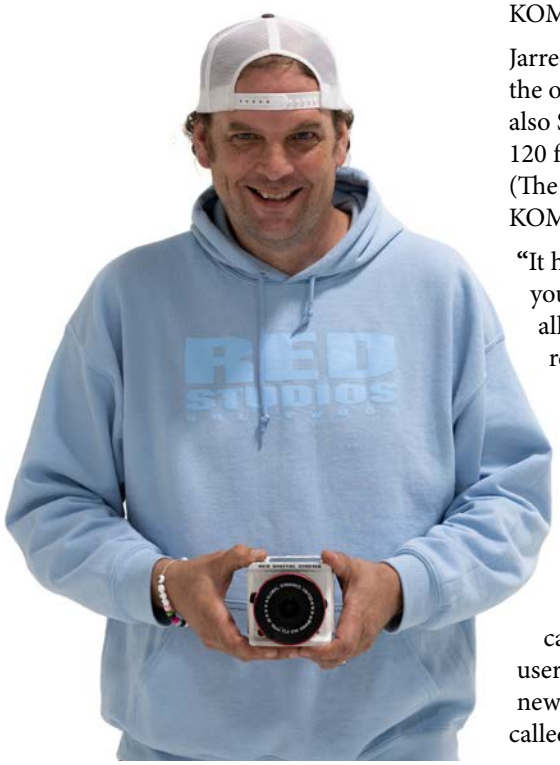
Cooke SP3 on Sony a7R5

1/4-20 lens support/anti-twist threaded socket on the bottom.

Focus scales with Imperial and Metric marks.

Cooke SP3 on RED KOMODO-X

So, instead of an entire camera truck, you can embark on your next production with just two cases: one Nanuk style RED KOMODO-X camera case for your RED KOMODO-X and one Peli style lens case.



KOMODO-X was introduced on May 16, 2023.

Jarred Land, holding a limited edition white ST (at left), said: "It's not a replacement for the original KOMODO, which was designed as a crash cam. The new KOMODO-X is also Super35 and goes twice the frame rates of KOMODO (up to 80 fps at 6K 17:9 and 120 fps at 4K 17:9). It uses a much faster CFexpress card for data, just like the RAPTOR. (The original KOMODO uses CFAST 2.0 media.) KOMODO-X fits nicely between the KOMODO and the Super35 V-RAPTOR, at a reasonable price—just under $10,000.

"It has the same width and height. It's just a little bit longer than the KOMODO. But, if you used a V-mount adapter on the back of KOMODO, the KOMODO-X is actually a bit smaller, all things considered. It's the size a lot of filmmakers really seem to respond to—with the little Medium Format style shape from yesteryears and this mechanical shape, even though it's a box, really resonates with people."

"The intended users are in the middle, between the KOMODO and the V-RAPTOR, but I expect it to bias a little more towards the KOMODO user who took that camera and wrapped it in bits and pieces to make it as much of an "A" camera as possible. I think those users will be very drawn to the KOMODO-X.

"A while ago, there weren't many cameras in the mid-range. That's changed a little. It's because a lot of people have been shooting with mirrorless cameras, which can give a pretty good image in ideal conditions. There becomes a point where those users start hitting the limitations of those cameras and start looking to move up. This new wave of filmmakers have created a new middle market, just above what was once called "prosumer" and KOMODO-X fits beautifully in there."

RED KOMODO compared with KOMODO-X

KOMODO

KOMODO has a regular RF Mount.

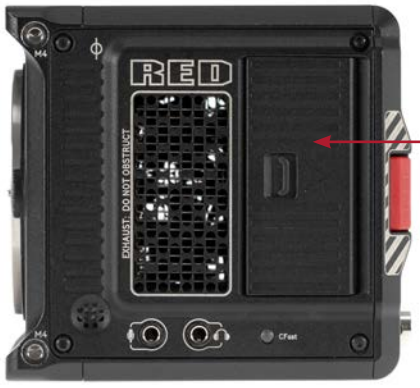
RF Mount:
20mm FFD,
54mm ID

KOMODO
Bottom view.
4 x 4 x 4" (LxWxH)

Bottom threaded socket centers are 12.5 mm apart.

Two Canon style BP-900 series 7.4V battery slots.

Rear Connectors:
- 9-pin EXT Port
- 12G-SDI OUt
- 7-17 V DC In



CFast 2.0
Media Card
Door

KOMODO-X

KOMODO-X has a locking RF Mount. Twist the lens clock-wise, then secure by rotating the locking lever clockwise.

KOMODO-X
Bottom view.
5.1 x 4 x 3.8" (LxWxH)

Bottom threaded socket centers are 25mm apart.

Micro V-Lock battery interface

Rear Connectors:
- USB-C
- 12G-SDI Out
- Headphones
- Audio In
- EXT
- 11-17 VDC In

CFexpress
Type B
Media Card
Door

RED KOMODO-X

The RED KOMODO-X is a camera user's camera, a constant delight you want to keep in your carry-on bag to take everywhere. It is thoughtfully designed and meticulously machined. Controls are intuitive. Of course, the images are beautiful.

Sensor

- SENSOR: KOMODO-X 19.9MP Super 35mm Global Shutter CMOS.
- EFFECTIVE PIXELS: 6144 (h) x 3240 (v) • DYNAMIC RANGE: 16.5+ stops
- SENSOR SIZE: 27.03 mm x 14.26 mm (Diagonal: 30.56mm).

Lens Mount

- MOUNT: Integrated locking RF mount with electronic communication
- Supports /i PL Lenses with RED RF to PL Adapters
- Supports Canon EF Adapter with communication and other adapters based on the RF mount

Recording

- MAX DATA RATES: Up to 560 MB/s using qualified CFexpress cards
- REDCODE RAW MAX FRAME RATES: 80 fps at 6K 17:9 (6144 x 3240)
  96 fps at 5K 17:9 (5120 x 2700)
  120 fps at 4K 17:9 (4096 x 2160)
  240 fps at 2K 17:9 (2048 x 1080)
- PLAYBACK FRAME RATES (PROJECT TIME BASE): 23.98, 24, 25, 29.97, 30, 50, 59.94, 60 fps, all resolutions
- REDCODE HQ, MQ, LQ, and ELQ at 6K 17:9 (6144 x 3240) up to 80 fps
- REDCODE HQ, MQ, LQ, and ELQ at 4K 17:9 (4096 x 2160) up to 120 fps
- REDCODE HQ, MQ, LQ, and ELQ at 2K 17:9 (2048 x 1080) up to 240 fps
- REDCODE RAW ACQUISITION FORMATS: 6K 17:9 (6144 x 3240), 2:1, 2.4:1, 16:9. 1:1, and Anamorphic 2x, 1.8x, 1.6x, 1.5x, 1.3x, 1.25x.

Although it has more features and functions than KOMODO KOMODO-X is still a very modular camera. Let's build it in various configurations on the following pages.

Attach RED DSMC3 RED TOUCH 7.0" SmallHD Monitor

Waist-level viewing, minimum size,
without top handle,
Hasselblad/Medium Format style.

Attach Top Handle with DSMC3 RED TOUCH 7.0” SmallHD Monitor

Waist-level viewing with top handle Hasselblad/Medium Format style.

Add an RF to EF Adapter and lens

If (gasp) you have not yet upgraded from EF to RF Mount lenses for your KOMODO-X, then you probably have one of Canon's RF to EF adapters.

Canon calls them EF-EOS R Lens Adapters.

Attach KOMODO-X RF to PL Adapter with Electronic ND

The RED RF to PL Adapter w/ Electronic ND Filter fits KOMODO 6K, KOMODO-X 6K, V-RAPTOR 8K VV, and V-RAPTOR 8K S35 cameras. The kit (at left) includes PL Mount Support Brackets for large or heavy lenses. However, you can attach the Adapter without brackets (as shown below).

The are two filters: Clear and Electronic ND Filter with a 2-7 stop range (ND.6 - ND2.1) in increments of ¼, 1/3 or full stops.

The Electronic variable ND filter is approximately 2mm thick. The RF to PL Adapter is factory-shimmed to the thickness of the filters included in the kit. To maintain correct focus, one of the two filters should be used.

KOMODO-X Menus

1. Top of camera and main dispaly.

2. Push Menu button to go to home page. Navigate with Up and Down arrow keys and SEL to Select. Let's select System Settings.

3. ND Density Mode for choice of how ND filters are indicated.

4. Choice of Density (eg: ND.6, ND.9 ...) or Stops (2 stops, 3 stops ...)

5. Seeing actual stops of light lost is nice—less math on set. Adjust ND, fps, ISO, iris, shutter and white balance directly on touch screen.

6. Here, we see 4 1/3 stops of light reduction. Because it is continuously variable, showing stops is easier than wondering if it's ND1.3 or ND1.4.

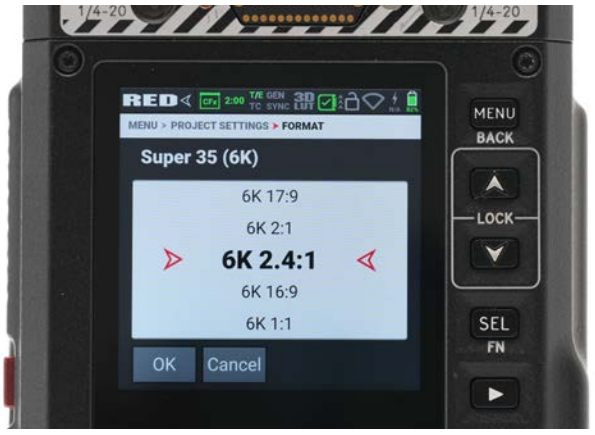
7. Or adjust settings directly from menu.

8. Next, let's select a LUT and then Project Settings.

KOMODO-X Menus

9. Access LUTs from Menu > IMAGE/LUT >3D LUT

10. Format, Resolution, Aspect Ratio and sensor dimensions helpfully appear.



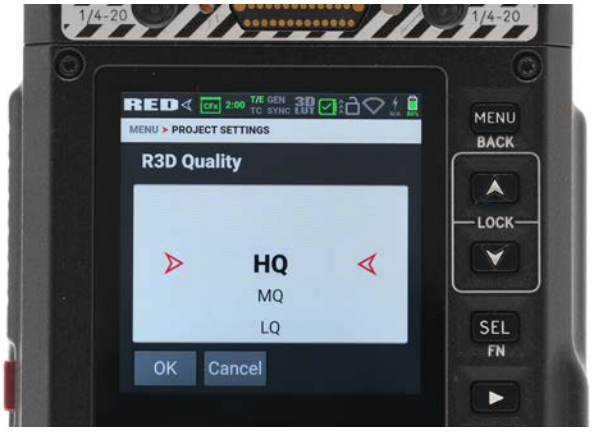
11. Resolution and Aspect Ratio.

12. Recording fps (in-camera); Project Time Base (fps at which images will be viewed); File Format for REDCODE RAW or ProRes; and Quality.

13. Base 23.98 fps

14. Recording at 79.92 fps slow motion.

15. File Format: R3D or ProRes.



16. R3D Quality: HQ (High Data Rate), MQ (Medium), LQ (Lower).

Wooden Camera Elite Accessory System for KOMODO-X

Wooden Camera is announcing the new Elite Accessory System for RED's KOMODO-X that aims to build up the camera into a full-fledged cinematography system, without compromising on size or weight.

Dominick Aiello said, "I am still blown away when I look at the KOMODO-X spec sheet and the powerful capture capabilities, and that is even before considering the incredibly compact size they achieved.

"As usual, our design process starts from the perspective of the rental houses and the pro camera crews on the punishing grind of cinema sets. For that level of production, it is critical to provide a combination of mounting flexibility, reliable power distribution and I/O expansion, all while ensuring our ergonomic focus on eliminating every sharp corner, so that the camera disappears into the shooting environment.

"And while the "rental house" productions can utilize the entire Elite System, the components are modular, allowing a more lightweight cine-style user to start with a few pieces and add the rest of the pieces as they grow their kit."

Highlights include:

- Next-generation D-Box Hot-swap power distribution that can connect directly to the 9-pin EXT port.
- Modular I/O B-Box, which can connect directly to camera or via the D-Box allowing embedded 24V power on the 3-pin RS port.
- 12G-SDI distribution box designed to fit ergonomically and modularly alongside the rest of the system.

Wooden Camera Accessory Plate System

Cheese Plate

Hook & Loop Plate

Hinge Rail Clamp Dual Rod Clamp Offset Bracket Rail

Picture this. Your brand new camera just arrived and goes out with you on a job tomorrow. Yikes, you don't even have a cage or accessory plates to mount your SmallHD Cine 7 monitor, Bolt wireless video transmitter, timecode box, wireless audio receiver, MDR, LR2, mobile phone and Sharpie marker.

Fortunately, you have Wooden Camera's new Accessory Plate System. It provides clever, universal mounting options for almost anything that attaches or sits on almost any camera.

Sometimes you want to Velcro something to the frustratingly rounded part of a camera body. Or you're bouncing around in a camera car, and wish you could securely screw the accessory tight into a threaded socket. Now you can.

Dominick Aiello, Sr. Director of Accessories at Creative Solutions, explains, "For years, our community has expressed the need for mounting options that allow them to streamline their builds for optimal placement of devices like a Bolt or distance measuring products. We've had these in the works for some time now, and we are excited to share what we came up with. It was interesting to be able to beta-test these plates and realize there was a need for even more accessories than were initially designed. We added some plates based on feedback from the community. The final collection is a product of many minds coming together to fill a need in industry."

The collection includes Cheese Plates, Hook-and-Loop Plates, Rail Mounts, and a variety of Hinges and Clamps. Each offers more secure mounting points on any build.

Accessory Plates come in various sizes: 5x5", 3x5", 2x5"and 2x2". They come with Velcro hooks and loops, or cut out like slices of Swiss Cheese—Cheese Plates! Each plate has a variety of mounting holes on the front, back and sides for use with any Mini Rail Accessory. The Cheese Plate Accessory Systems have many ⅜-16 and ¼-20 mounting threads that are helpfully labelled for the accessory they were intended to hold.

Mini Rail Mounts: you attach the Accessory Plates to Mini Rail Mounts that screw onto the camera horizontally or vertically. They come in 100mm, 60mm and 40mm lengths.

The **Universal Accessory Hinges and Clamps** have a ⅜-16 threaded attachment with movable pins and a 90-degree tilt for accessory plates using the rail mounts.

Universal Dual Rod Clamp is a 15mm, lightweight rod mount that includes 4x ⅜-16 mounts with pinholes built into the middle of the accessory. The Rod Clamp has dual tie down knobs. Paired with a Universal Hinge system, you can add a battery plate using a 2x5" Cheese Plate. Or, you can attach a focus range finder system to the front rails.

28mm Offset Bracket uses a ⅜-16 thread with mounting pins and it attaches directly to the camera or camera cage.

AJA HDR Image Analyzer 12G v3.0 Software Update

AJA HDR Image Analyzer with live picture at right. On monitor at left: Dolby Vision Inspection and Presentation – L1 metadata carried over SDI shown in Lumi Color Waveform on upper left as Min, Avg, and Max NIT lines and shown in the lower right analysis window.

AJA HDR Image Analyzer 12G

AJA HDR Image Analyzer 12G is a real-time SDR, HDR and WCG (Wide Color Gamut) monitoring and analysis device, developed in partnership with Colorfront. It combines AJA's I/O technology and Colorfront's image analysis software in a compact 1RU chassis.

The Image Analyzer 12G provides waveform, histogram, vectorscope, analysis and all kinds of content monitoring up to 8K via 12G-SDI and up to 4K via NDI.

AJA Version 3.0 Software update

September 6, 2023. AJA Video Systems announced v3.0 Software update for the AJA HDR Image Analyzer 12G, with new features for HDR monitoring, analysis and QC on multi-cam shows and in post production suites.

The free update increases the number of video channels that can be analyzed simultaneously, integrates new Dolby Vision tools, adds connectivity options, expands 8K/UHD2 format support, and includes support for the latest ARRI LogC4 color science.

The rapid increase in multi-camera productions (concerts, live events, theater and sports) has made side-by-side analysis of multiple signals essential. The ability to see adjustments in real time is also critical, especially when matching multiple cameras.

With v3.0 Software, HDR Image Analyzer 12G now supports up to 4 separate channels of signal analysis—up to 4x 4K/UHD. Each quadrant in the user interface is individually configurable to present an analysis tool for any of the four channels. You can also access a four-channel view — with each channel showing the image, waveform, and vectorscope plus audio metering.

HDR Image Analyzer 12G v3.0 introduces Dolby Vision dynamic metadata inspection and presentation, with support for Dolby Vision v4.0 and v2.9 via SDI, detected automatically. This improvement lets you view Dolby Vision metadata in various ways. L1 metadata is presented visually in the waveform as NIT markers and the Dolby Vision Metadata analysis tool presents other Dolby Vision metadata as readable text. You can watch it change in real time, scene-by-scene and shot-by-shot. Or, you can see how the metadata is changed upstream of the HDR Image Analyzer, as adjustments are made in real time. Helping to accelerate color analysis and quality control, this provides greater confidence that you've generated and validated the correct Dolby Vision metadata.

HDR Image Analyzer 12G v3.0 connects to more device types. Now, you can receive Full NDI (Network Device Interface) 4K/UHD/2K/HD source signals over an Ethernet connection and run them through the HDR Image Analyzer 12G's analysis toolset in the same way as you would with an SDI signal. No additional, external conversion technology is required. This saves space, power, and cost.

AJA's HDR Image Analyzer 12G v3.0 supports additional camera log profiles, and manages more 8K formats by including new native support for ARRI LogC4 color space analysis and quad-link two-sample interleaving (2SI) 8K/UHD2 transport. 8K 2SI/SQD quad-link YCbCr up to 60 fps, 8K 2SI/SQD quad-link RGB up to 30 fps, and 8K dual-link YCbCr up to 30 fps are now supported.

Front

AJA HDR Image Analyzer 12G v3.0 Software Update

AJA President Nick Rashby said:

"Across the production chain, technology and procedures are progressing rapidly. AJA is dedicated to ensuring users are equipped with the tools they need to adapt with the industry, and our latest update for HDR Image Analyzer 12G is a reflection of that. It meets modern production demands with increased signal analysis capacity, new Dolby Vision SDI metadata inspection and analysis, NDI connectivity and a number of other exciting improvements designed with user feedback in mind."

As usual, like Oliver Twist, FDTimes wanted more.

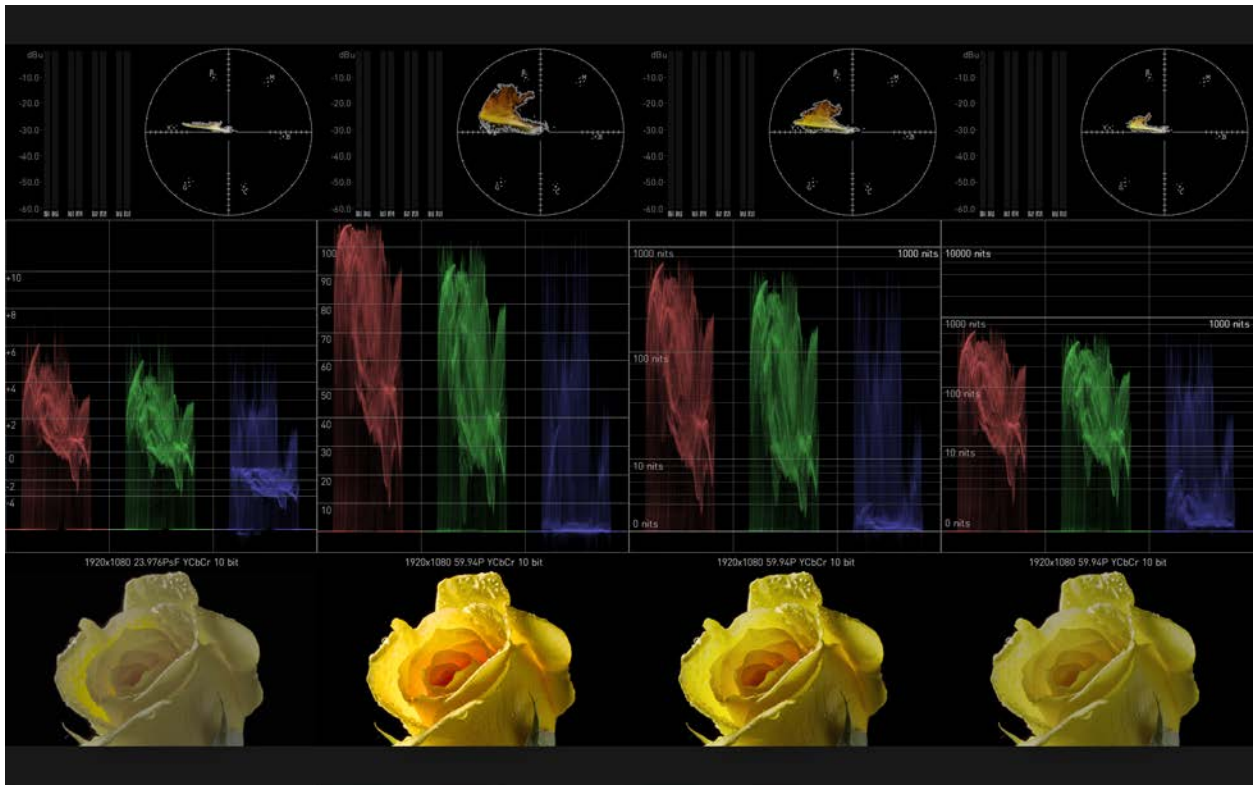
Tim Walker, Senior Product Manager at AJA, discussed the HDR Image Analyzer 12G in depth:

Up to now, we've had a lot of success with this product in QC, quality control applications in post-production. Users are excited about the product and the updates. Colorists have enjoyed the HDR Image Analyzer 12G as well and they will all be happy to see these amazing upgrades. It should be noted that not everyone needs to be doing HDR signal analysis, and even though this is an "HDR Image Analyzer" It also analyzes everything from camera log inputs to SDR sources, as well as HDR sources. So it spans a wide range of color analysis applications, not just HDR.

We're also expanding some of the HDR Image Analyzer 12G's connectivity capabilities by supporting NDI, and this opens the door to a broader base of customers and applications. By adding this ability, you can mix and match SDI and NDI signal analysis and analyze them simultaneously. NDI is starting to get its fingers in lots of different places in the industry and we are often seeing it show up side by side with SDI signals. Up to now, there hasn't been a tool like a waveform monitor or rasterizer that can actually accept an NDI source and analyze it using the same tools that we use in our SDI world. We are now introducing this hybrid connectivity/analysis capability with our v3.0 update.

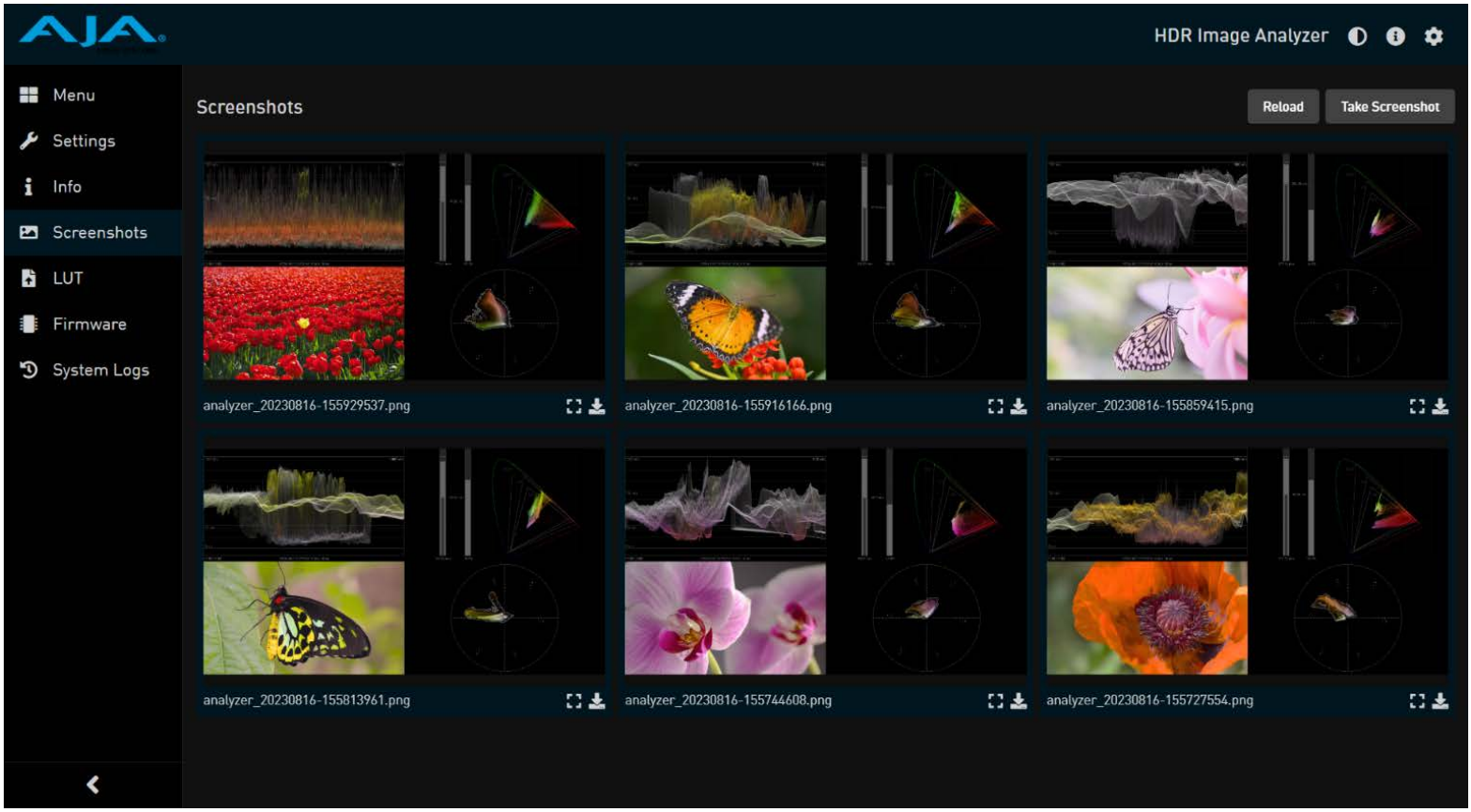
Multi-Channel Signal Analysis

Currently the HDR Image Analyzer is really a single channel analysis product. There are four quadrants of analysis tools. You have options of a lot of different tools to put in each of those four quadrants, but at the end of the day, you're only analyzing one signal.



UI showing four simultaneous channels. Multi-Channel Signal Analysis in 4-channel mode: 4 unique sources analyzed simultaneously. From Left to right: Camera Log, converted to SDR, converted to HLG, and converted to PQ.

AJA HDR Image Analyzer 12G v3.0 Software Update



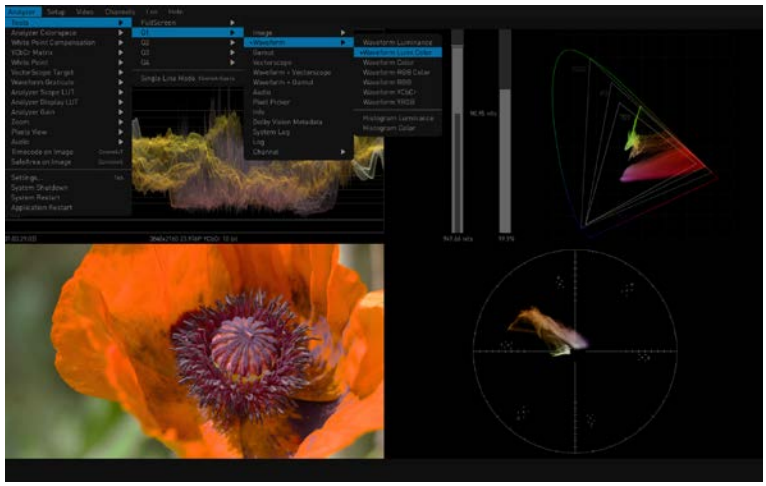
Web UI - user interface view on computer monitor.

One of the biggest things that we're offering now is the ability to analyze four channels at one time. So, you could have four different waveform monitors in each one of those four quadrants from four different signals, SDI or NDI. That's a big deal because you're essentially almost quadrupling the signal analysis capacity of the product. Yes, you still have four analysis tools, but you could have a waveform and a false color as well as a waveform and a false color stacked up for two different sources if you wanted to. Each one of those quadrants is individually configurable, not only by the tool that you want to use to analyze with, but also by any of the four channels available. Those source signals could be up to 4K—so simultaneous analysis of up to 4x 4K/UltraHD signals is possible. As stated earlier there is also a new 4 channel view that shows the 4 channels at one time, each with the image, waveform, and vectorscope plus audio metering.

NDI

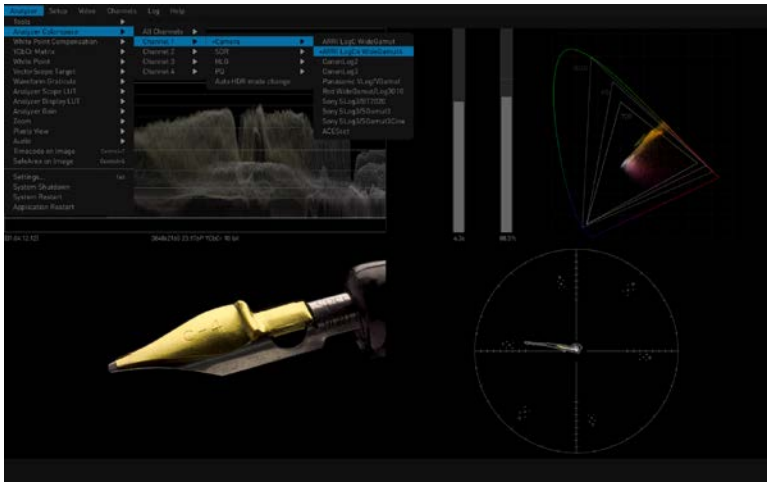
There are a couple of different flavors of NDI. Our AJA HDR Image Analyzer 12G supports high bandwidth NDI. It goes by many names: Full NDI, just NDI, NDI high bandwidth or NDI SpeedHQ. Those are all different ways to describe what this supports. (It does not support HX2 or HX3, which are some different types of NDI.)

Mix and match SDI and NDI sources for simultaneous signal analysis.

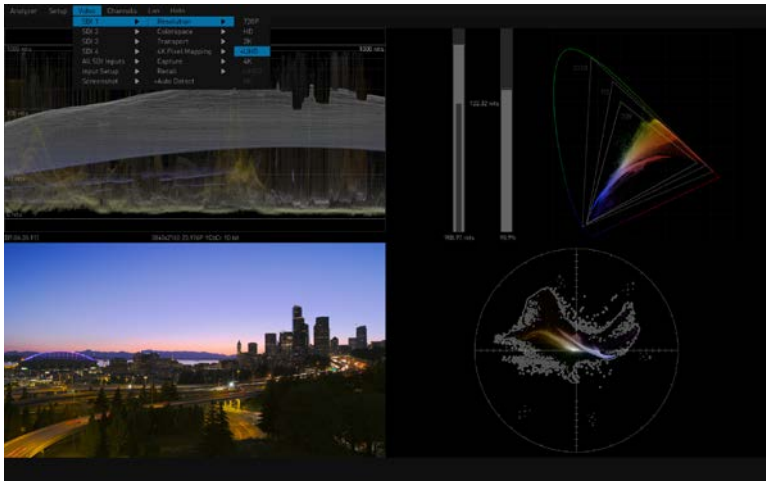


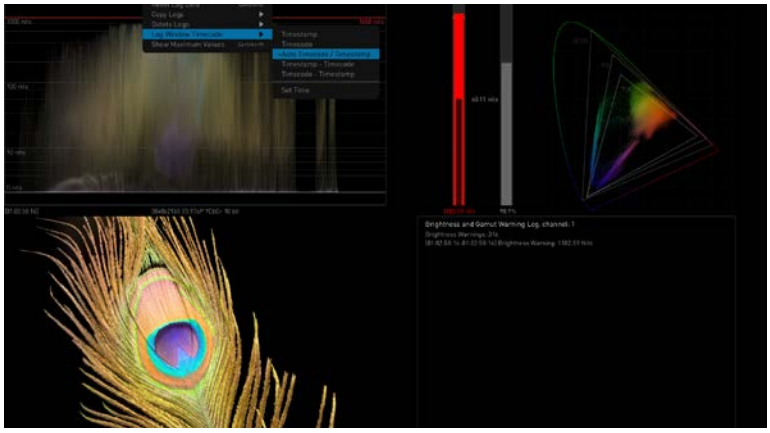
Configurable layouts of 4 simultaneous channels.

AJA HDR Image Analyzer 12G v3.0 Software Update

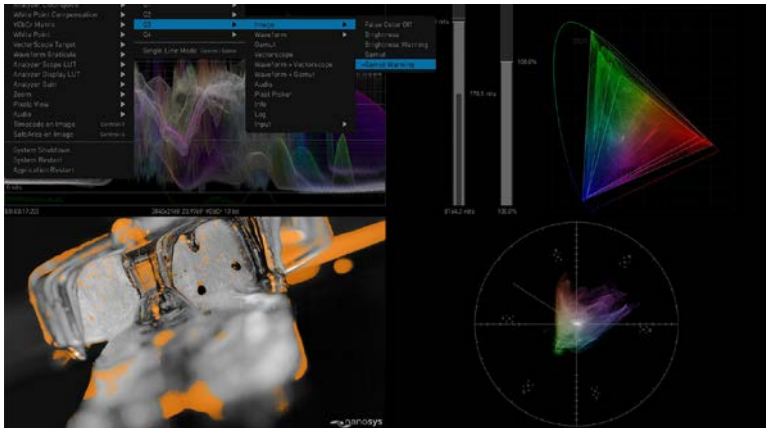


Analyze ARRI, Canon, Panasonic, RED and Sony Log video.

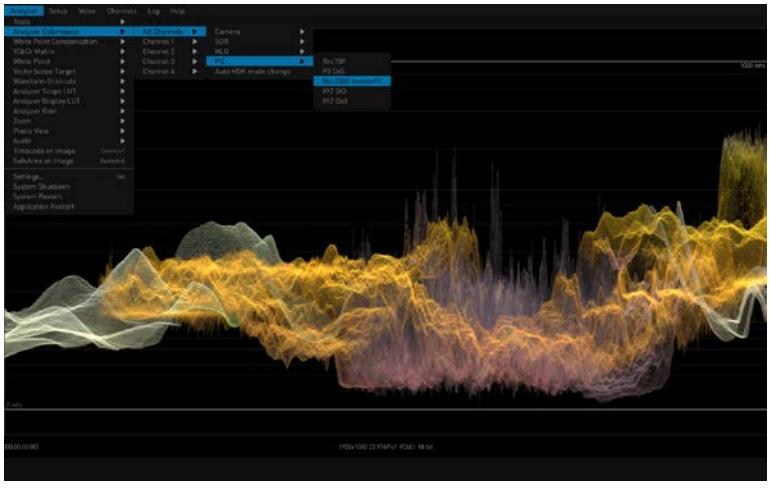




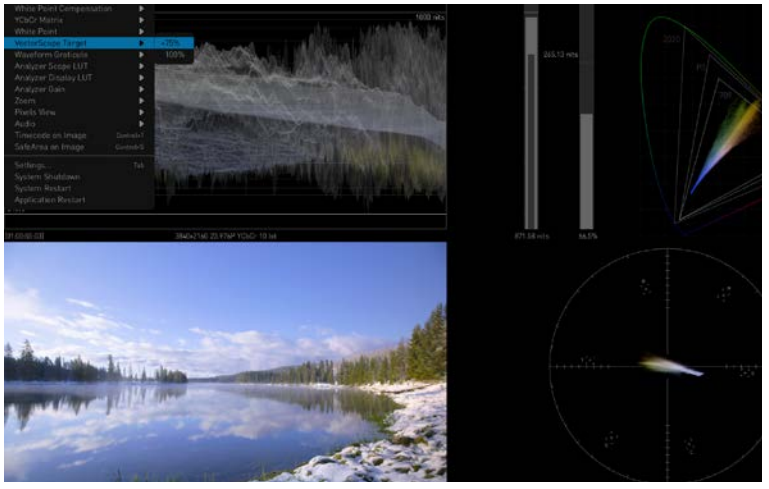
Log and share P3 Gamut and brightness violations in HDR footage.



False color gamut warning shows problem areas of your image.



Color Space options: in this example, PQ Rec2020.



Vectorscope Targeting—zoom onto a feature or face, especially helpful for matching skin tones or skies.

Matching cameras

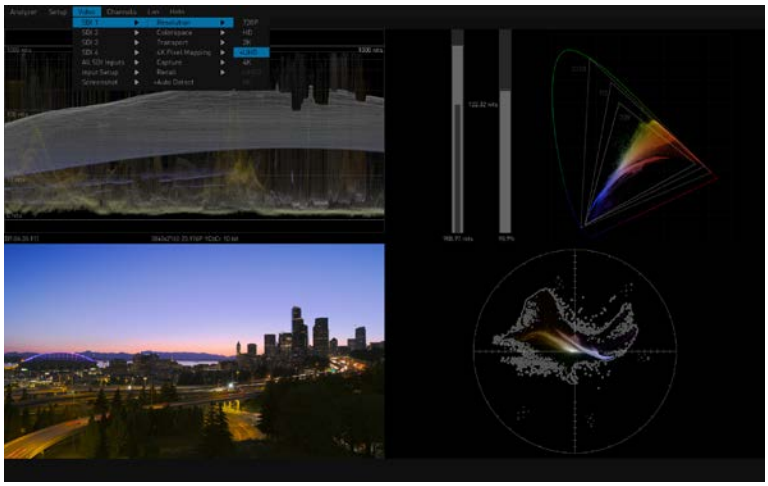
If you're matching cameras to make sure they are actually outputting the same thing, you can line them up side by side in the analysis window to see exactly where the RGBs are.

How would a colorist use the HDR Image Analyzer 12G v3.0?

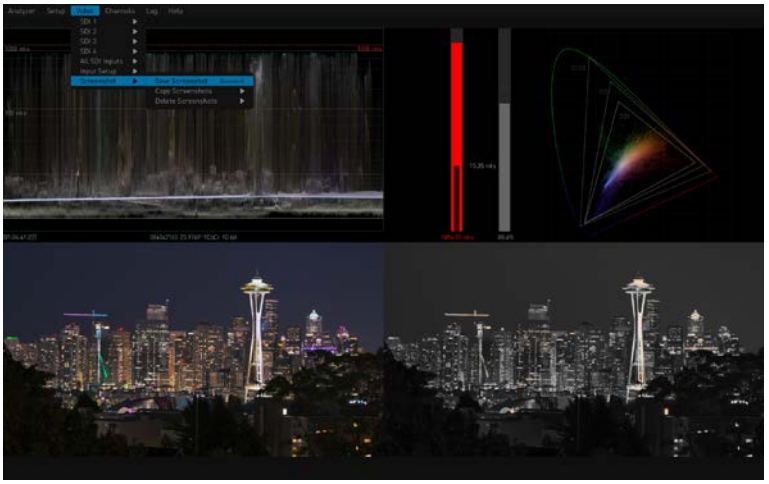
As you're grading, you could output an SDI signal from your computer or workstation, and that SDI output could go directly into the Image Analyzer. Then, the Image Analyzer can present a user interface that will show your changes in the color corrector, and you'll be able to see it immediately on the waveform and see how you're manipulating the color.

Another unique feature of the Image Analyzer is that it is one of the only rasterizers on the market that can output its user interface in full 4K HDR over DisplayPort. You can get a very high resolution image of either your actual content or one of the tools that you're using to fine-tune that image.

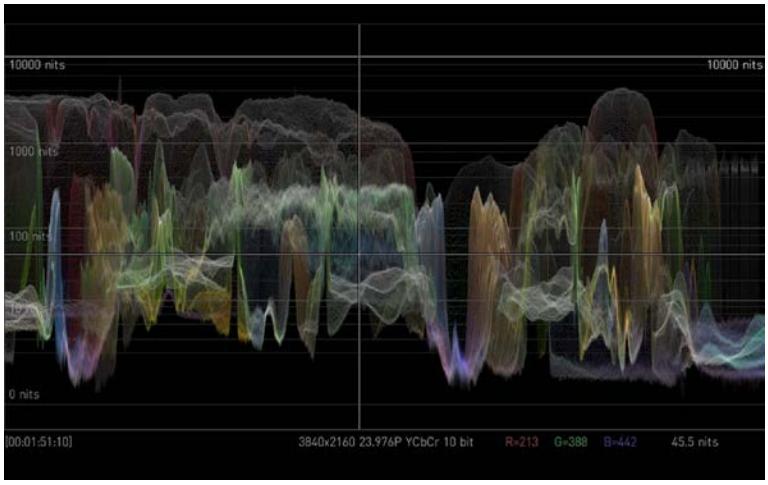
AJA HDR Image Analyzer 12G v3.0 Software Update



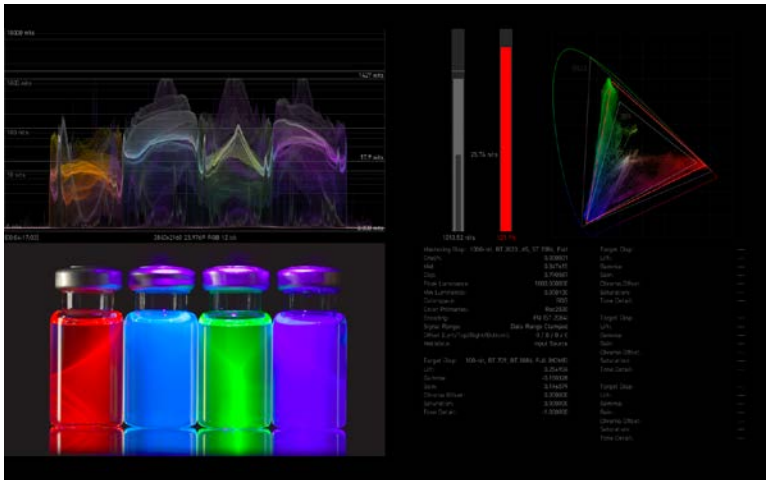
Video Sources.



Screenshot Capture.



Waveform Lumi Color: Project's luminance and color.



Dolby Vision Inspection and Presentation – L1 metadata carried over SDI shown in Lumi Color Waveform on upper left as Min, Avg, and Max NIT lines and shown in the lower right analysis window.

Expanded support for the latest color science and 8K

Currently the Image Analyzer supports a lot of different native camera color spaces and color science.

ARRI came out with their ARRI LogC4 around this time last year. It's starting to be used more widely in the industry as they offer different ways to be able to convert different log formats into LogC4. And so, we want to be able to make sure that we support that latest color space in a product like this. You can come in natively with ARRI LogC4, and we can display and analyze it in its native color space and show it to you. In the waveform, the graticules are shown as stops rather than NITs so we can properly analyze the new color space.

The HDR Image Analyzer 12G v3.0 update keeps up with our other products that offer ARRI LogC4 conversion, like our AJA ColorBox and FS-HDR both with the Colorfront Engine. So it's rounding out our color tool set for supporting ARRI LogC4.

We also support Canon, Panasonic, RED, and Sony cameras.

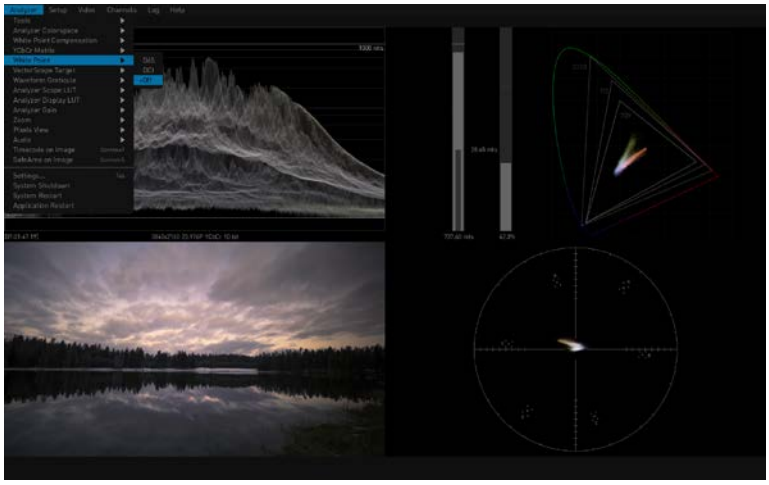
Dolby Vision

One of the other new things that we are doing in the Image Analyzer is something that's really kind of new. Dolby Vision is generally carried as metadata, and some products are embedding/tunneling it into the SDI signal and outputting it that way. For products that do, the Image Analyzer can be connected to the SDI output and now we can inspect that Dolby Vision dynamic metadata and actually present it to the user in a couple of different ways.

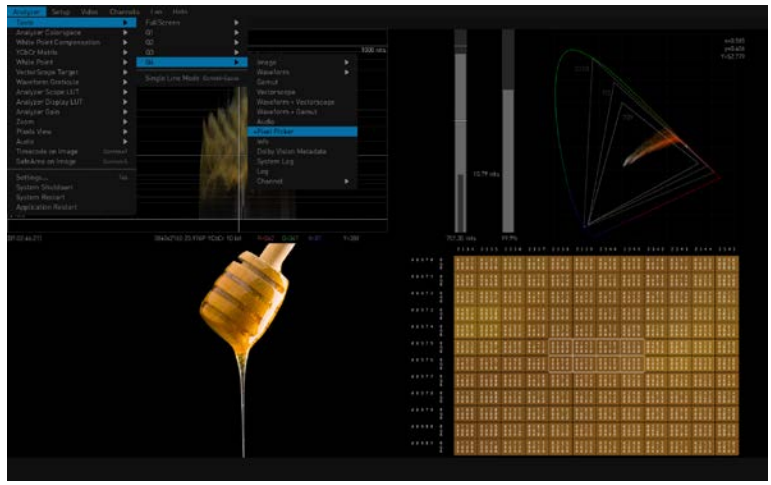
We can look at the L1 metadata and present it on the waveform monitor as the Min, Avg, and Max NIT values, and be able to see that change in real-time and shot-by-shot or scene-by-scene as the metadata is changing.

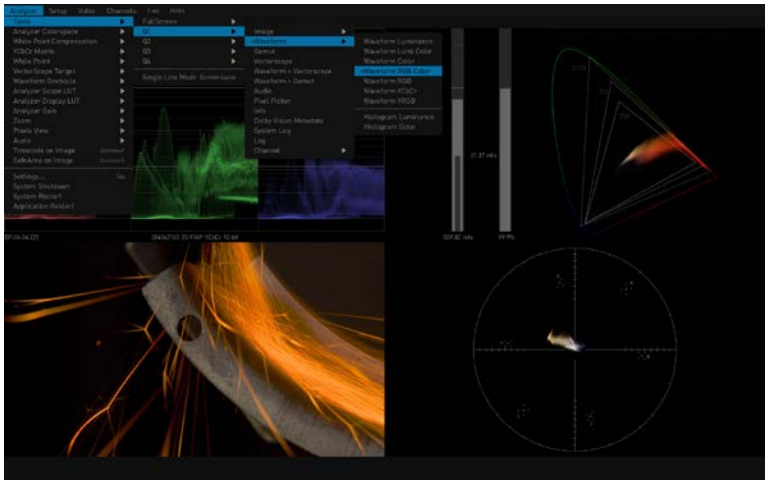
We also have a Dolby Vision metadata tool that's in the analyzer. It can present all of the metadata in a human-readable format, so you can actually see it there and have it presented in the waveform as well. The brightness bar on the gamut tool will also turn red if the signal goes outside the L1 Max. It is another helpful tool for people doing QC of content that has Dolby Vision embedded in it.

AJA HDR Image Analyzer 12G v3.0 Software Update



Whitepoint: Set DCI, D65 or none.





HDR Analysis Tools

Timecode can be overlayed on screen.

Grading in SDR, HDR, and Dolby Vision

HDR Image Analyzer 12G will help colorists do more passes in a shorter amount of time. They don't even need to have an HDR monitor to see it. They can still analyze it with this tool and have it presented on an SDR monitor if they want to. The Analyzer even allows you to load in LUTs so you can analyze the signal with a LUT applied or if you just want to put a LUT on just the display to make an HDR signal look right on an SDR display, you can do that too. Either way, the analyzer will help them quickly visualize where the limits are, validate the code values of specific brand colors, inspect metadata and so much more.

8K Video

More and more 8K is being done. As you might imagine, there are still the challenges that go along with any kind of new technology. Yes, our product does support 8K signal analysis.

Some customers have utilized it not just to analyze the color of their 8K signal, but also to help validate their workflow and connections to other 8K source devices that are supposed to be outputting 8K, but may not be properly signaling it to other devices that are downstream of it.

That signaling comes in the form of the VPIDs, or video payload identifiers. There's a SMPTE standard for how you signal or configure your VPID to let other products know what you are. People are using the Image Analyzer to validate that other products are outputting the correct VPIDs. Their signal path might not have been working correctly because these VPIDs were incorrect, and they needed the analyzer to be able to reveal that.

No price increase

We think the v3.0 Software update should add great value to the AJA HDR Image Analyzer 12G. We're not increasing the list price. We're keeping the price the same, and we're adding a lot of new capabilities to it. It's kind of a big deal.

aja.com

ZEISS CinCraft Scenario

CinCraft Scenario CamBar, Origin and Link (left to right)

You may have asked, "What were they thinking?" When ZEISS announced the acquisition of Ncam Technologies, a few souls wondered what a venerable 177-year-old lens company would do with a young camera tracking company.

In the acquisition announcement on July 18, 2023, Christophe Casenave, Head of Cine Products at ZEISS, hinted, "We are happy to be combining Ncam's unique tracking technology with ZEISS's longstanding expertise in cinema lenses, lens data and the cinema market. This enables us to think beyond current camera tracking capabilities to offer new ideas..."

Now we know about those new ideas. ZEISS and Ncam have been working together for the past two years on an innovative, easy-to-use, lightweight, portable, affordable, real-time camera tracking system that sits on top of your camera or mattebox. It's called ZEISS CinCraft Scenario. It is another step in the democratization of VFX.

CinCraft Scenario comes in a small Peli-style case. It consists of three parts:

1. CamBar acts as the eyes of the system—perched on top of your camera or mattebox. Its machine vision cameras identify objects in a scene that can be used as natural tracking points or can be illuminated using its infrared emitters. The CamBar connects to CinCraft Origin (the Brain) directly or with the smaller CinCraft Link.

2. CinCraft Link is a lightweight unit about the size of an MDR (Lens Control Motor Driver/Receiver) that passes data from the CamBar to the CinCraft Origin. Link attaches to the camera, has a lens data input connector, and accessory power connector.

3.CinCraft Origin is essentially a small computer with connections for keyboard, mouse and monitor. It will usually sit on a DIT or VFX cart.

FDTimes spoke with Christophe Casenave about CinCraft Scenario.

Jon Fauer: When and how did this project begin?

Christophe Casenave: It's a long story. In the beginning, Sundeep Reddy, a ZEISS Product Manager, told me about Ncam. He said that we needed to talk because ZEISS eXtended Data in our lenses seemed to be in search of an application. I said, "But we are already working with applications such as Pomfort Silverstack and Livegrade and others to perform on-set visualizations, removal of distortion, et cetera. And, we already had projects at ZEISS to leverage lens data beyond its current applications, including CinCraft Mapper."

Sundeep told me, "Ncam does cool camera tracking and they need lens data for this." I talked with Ncam and met Brice Michoud, who happens to be French, like me. We had some discussions about how important lens data is for camera tracking and how important camera tracking will be for the future of cinema because of visual effects.

Brice, Nic Hatch, co-founder and CEO of Ncam, and I met again at IBC 2019. After this, we were all in agreement to do something together. I met Nic again at HPA 2020. We talked a bit more concretely and he said, "We would be interested in an in-depth cooperation, especially to accelerate our growth and technology development. We would like to find an industrial partner and investor."

I returned to ZEISS headquarters in Oberkochen, Germany and discussed the idea with our executive management. We agreed that it could be interesting for ZEISS and would be a good match because we have lenses, we have lens data, they have camera tracking and there could be a good synergy for all of us.

We defined the roadmap for what we wanted to do and what we thought would be the future of camera tracking in combination with lens data. We identified that, while this is something cool, it

could be difficult to use. The key was to really make it simple and understandable. For example, a cine camera is a complex device, but it is relatively simple to be used by a skilled DP, camera operator and assistant. This is what we wanted to do with camera tracking. Make it simple enough so that a VFX supervisor or crew on a film set could operate it easily. This was clearly the target. We also agreed that the key to all of this was shortening prep time at rental houses by eliminating the time-consuming process of having to calibrate all the lenses by shooting test charts in advance. Once this is done, you remove 80% of the hurdle and that is how we began the project.

When is camera tracking needed?

We need camera tracking information whenever we want to integrate computer graphics or visual effects into a film, whether by making set extensions, replacing green or blue screen, or when working in LED Volumes. To do this, we need to know the perspective from which the scene is viewed. To render and realize the composite image, we need to know exactly where on the set our main camera is positioned. We need to know where our camera is, compared to the virtual set, and we need to know where this camera is moving and into what direction it's pointing.

What is camera tracking?

Basically, camera tracking is all about computing the camera position. You could say it's like GPS for the camera, to give you the position of your camera in a very precise way. But in order to do the compositing, you need to know much more. You need to know what lens you have—in order to know the field of view of your camera. You need to know the nodal point or the non-parallel point of your lens in order to make the compositing look realistic. This is camera tracking.

In classical and earlier VFX work, you might do the camera tracking in post-production with some software tools that could, more or less, compute camera position from the footage itself. This is time-consuming, labor intensive and in some cases, more complex. Imagine shooting with the lens aperture wide open and a lot of the background is out of focus. Then, your software would have difficulty to track that out-of-focus background. There are a lot of limitations and also long setup and preparation time to make the software work properly.

With our new CinCraft Scenario, to do the camera tracking on a film set, you simply add two small devices (the CamBar and Link) onto the camera. You can use the tracking information in post-production to either skip the match-moving process or to accelerate and simplify the process by providing tracking and point cloud data recorded on set.

You can also, of course, use CinCraft Scenario for pre-visualization on set. For example, when shooting in a green screen studio, you can position your CGI element to see how it will look once the foreground and background are composited.

Another example is a scene with windows in a room and you want to have green screen for the views outside. You can use CinCraft Scenario's camera tracking to replace them in real time. Or, if those windows are looking out onto an LED Volume, camera tracking can adjust the parallax as the camera moves and the LED scene changes in real time as the background is rendered.

What about lenses that don't have any metadata at all? Let's say with vintage lenses?

We have launched CinCraft Mapper. It provides data for ZEISS lenses that do not have ZEISS eXtended Data. There is a database with distortion and shading information on the ZEISS server and the CinCraft Scenario will also have access to this database. *(cincraft.zeiss.com/mapper)*

For example, let's say you are working with Master Primes. You can download lens parameters from the ZEISS CinCraft server (actually it will be done automatically). Because CinCraft Scenario will need the focus, iris and zoom values for every position,

it can look up the right lens characteristics. Master Primes are a very simple case because they have LDS (LDS-1) lens metadata. If you use a camera that reads LDS, usually an ARRI camera, it'll get the focus and iris information from the LDS, and then CinCraft Scenario will get the rest of the information via the SDI output and then look up the correct distortion data.

With older lenses, like ZEISS Super Speeds, it's simple as well. The data is also on our database, but the focus and iris positions are received from a lens motor. We are working with Preston Cinema Systems, cmotion, Teradek, Tilta and others on this. So, if you use a Preston or ARRI wireless lens control motor, it will communicate via the camera or via an RS232 serial interface to CinCraft Scenario and will compute the distortion. If you do not use any of these lens control systems, then there is still the possibility to install ZEISS CinCraft homebrew encoders to get these values.

Providing the data is really a big game changer because this allows you to just plug in your lens and it works, which is not always the case for other tracking systems.

How does CinCraft Scenario work?

The big thing with CinCraft Scenario is that is uses natural markers! A natural marker is, for example, the edge of a piece of furniture on set, an impurity in a wall, a fire hydrant on the sidewalk, crosswalk lines in the street, and so on.

Usually there are many natural markers in a scene. Let's say we are in a room or in a forest. I would not need to place a single marker because there are so many places that can work as natural markers— a window frame, a door, an object. The system will find its own markers. In some cases, there may not be any, or enough, natural markers.

Let's say if I'm in a pure green screen environment. In this case, I can place reflective markers to either enhance the natural markers or even replace them completely. By the way, these reflective markers will need to be placed according to a pattern that CinCraft Scenario will provide. Users will be guided to where they need to place them.

Another interesting thing with CinCraft Scenario is that the system can also use technology that has been developed, for example, by Brompton. If you have an LED wall, you can use virtual markers on the display.

CinCraft Scenario is very flexible and modular. The hardware is not that expensive, it's not big. You can change the configuration quite quickly. It's not linked to just one environment. If, in the morning, you shoot outside and want to make a set extension, then you can use the natural environment for tracking. In the afternoon, you go back into the studio where you have configured a green screen with reflective markers. It's very flexible and portable.

In the past, tracking was more or less linked to the studio. That's why it was also used a lot in broadcast. This new tracking system belongs to the camera and can go wherever the camera goes.

Who will be the purchasers of CinCraft Scenario? Rental houses, owner-operators, VFX companies?

Yes, rental houses, owner-operators, VFX companies—and volumes, studios with green or blue screens, broadcast and more.

Because, if you work in an LED Volume, or you do green screen and want to do live set extension, then you need a camera tracking system.

Because CinCraft Scenario works seamlessly with the camera, we believe it should and could be a camera rental product. Just as you currently see a wireless lens control system, Light Ranger, Cine Tape or focus rangefinder device on almost every camera, you can just add the CinCraft CamBar in front of any camera. That provides camera tracking and data recording of the data to pass along to post-production. It'll save a lot of time, a lot of hassle and also provide more data to those teams.

What was the reason for doing this?

The entire paradigm of the product is that we have redesigned the whole thing to match the standard precedures of a standard film production. You have crew who will prep everything in the rental house because you need to link the camera tracking with the camera type, with the lens type, and that's it. You then save your configuration and bring one additional case, containing the compact CinCraft Scenario, to the location or set. Once there, you are ready to go. And while it is, of course, better to have a dedicated tracking operator on set, a well-trained VFX supervisor or any other crew professional like an AC could set it up, start tracking and record data.

What happens to the people at Ncam?

The Ncam team consists of about 25 people. The team in the UK, including R&D, will remain there. Also, they have people in various countries, and they will work as part of the ZEISS local sales teams.

What about happy customers of the current NCAM system?

ZEISS gives existing NCAM customers the possibility to upgrade their system to a standard that makes it equivalent to the new ZEISS CinCraft Scenario solution. There will be no need for them to acquire new hardware to get the benefits of the new user experience and all the services linked to CinCraft. Nevertheless, in case they want to increase the accuracy of their system, they will also be able to upgrade just their Camera Bar to the new ZEISS CinCraft Cambar—and still keep the other hardware elements. So, it's very sustainable!

How much will CinCraft Scenario cost and when will it be available?

A fully usable kit with hardware and a 1 year license of the software will be about the cost of a set of five CP.3 XD lenses...or slightly more than the price of one ZEISS Supreme prime.

It will be available from select dealers and the ZEISS CinCraft website by late Fall 2023.

In summary...

The big message, in my opinion, is that while is it not common for us to have on-set real-time camera tracking for classical VFX, now is the time to do this instead on relying only on post-production match-moving. There are couple of scenarios where real-time camera tracking is already well understood—typically in a volume or on a big-budget film for pre-viz purpose. My message is that everybody who does even a small amount of visual effects can now use the ZEISS CinCraft Scenario system to record real-time camera tracking data and make the life of post-production people easier. It is a simple, modular and affordable system.

For more information, go to: *zeiss.ly/cincraft-scenario*

SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary for Fujifilm X Mount

Photo by William Steel, courtesy of SIGMA.

Fujifilm X Series is a comprehensive lineup that includes X-T5, X-H2S, X-H2, X-Pro3, X-S20 and many more cameras. X Series cameras and lenses cover APS-C format (23.5mm x 15.7mm), which is very close to Super35.

By the way, Fujifilm doesn't do Full Frame / Large Format. Their Larger Format is the GFX series of cameras and lenses, covering a 43.8 x 32.9 mm image area. More on that later in this edition.

But we're here to talk about SIGMA's selection of lenses in dedicated X Mounts. The new 100-400mm F5-6.3 DG DN OS | Contemporary zoom and 23mm F1.4 DC DN | Contemporary prime expands the line of SIGMA lenses for Fujifilm X Mount to six.

The 100-400mm F5-6.3 is the second zoom lens for Fujifilm X mount, joining the compact 18-50mm F2.8 DC DN | Contemporary lens.

The 23mm F1.4 joins the fast F1.4 prime line, which includes:

- 16mm F1.4 DC DN | Contemporary.
- 30mm F1.4 DC DN | Contemporary.
- 56mm F1.4 DC DN | Contemporary.

These X Mount lenses join the Leica L and Sony E-mount versions, which are currently available.

SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary

The SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary for X-mount is a super-telephoto zoom covering an angle of view equivalent to 150-600mm in Full Frame when attached to an APS-C camera.

Despite covering an ultra-telephoto range, the lens has a compact design with an overall length of 199.5mm, a maximum diameter of 86mm, and a weight of 1,135g.

SIGMA 23mm F1.4 DC DN | Contemporary for Fujifilm X Mount

The SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary, originally designed for Full-Frame mirrorless cameras, can be used with an APS-C format X Mount body to deliver extremely high performance all the way to the edges of frame.

A control algorithm including AF drive and communication speed optimization has been developed specifically for X Mount interchangeable lenses. In addition to achieving high-speed AF, the lens also supports AF-C (Continuous AF) and in-camera aberration correction (on supported cameras). The mount is rubber-sealed to protect the lens in hostile environments.

The switches on the lens have also been optimized for X Mount. The "AF Function Setting Switch" lets you select a function when the AF function button is pressed on the lens side.

In addition to a high-speed and smooth AF enabled by the stepping motor and the latest algorithms, the SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary incorporates powerful optical image stabilization (OS) of five stops.

Thanks to its light weight, long reach and optical stabilization, the SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary is great for hand-held nature photography, wildlife, sports, birding, and travel photography. An optional tripod socket kit TS-111 is available if you want to support the lens on a monopod or tripod.

SIGMA 23mm F1.4 DC DN | Contemporary

The SIGMA 23mm F1.4 DC DN | Contemporary is a wide-angle fast-aperture prime lens designed specifically for APS-C mirrorless systems. This lens has a similar field of view as a 35mm in Full Frame format. A control algorithm including AF drive and communication speed optimization has been developed specifically for X Mount interchangeable lenses. In addition to high-speed AF, the lens also supports AF-C (Continuous AF) and in-camera aberration correction. The mount is rubber-sealed.

AF is driven by a quiet, high-speed stepping motor for swift, silent operation for both still and video capture, and it has excellent flare/ghosting resistance. It has a maximum magnification ratio of 1:7.3 and a minimum focusing distance of just under 10 inches.

The lens is ideal for landscapes, photo journalism, everyday photography, and much more.

The SIGMA 100-400mm F5-6.3 DG DN OS | Contemporary ($949 US)
and
SIGMA 23mm F1.4 DC DN | Contemporary ($549 US) is available for Fujifilm X Mount cameras at Authorized US Dealers beginning September 21, 2023.

SIGMA 23mm F1.4 DC DN | Contemporary lens for Fujifilm X Mount, mounted to Fujifilm X-S10 camera body, photo by Meg Loeks.

Infinity Photo-Optical TS-160: Microscope Technology meets Cinematography

Fruit fly taken with Micro HM lens at 16x magnification. Photo by Roy Larimer.

ECU in a script usually means extreme close-up on an actor's face. ECU in Jay Margolis's world means 4x macro or 16x micro views, like the scary face of a fruit fly, above.

Jay Margolis is the founder and president of Infinity Photo-Optical, makers of extremely sharp and incredibly close-focus lenses for cine and still cameras. As a boy growing up in New Jersey, Jay was fascinated by things near and far: microscopes and telescopes. He graduated from The University of Colorado, Boulder, went to work at Bausch and Lomb, and received a Masters Degree from Colorado State University.

But we digress. For me, this story began at Clairmont Camera. Denny was wildly enthusiastic about the cinematized (Clairmontized) model of Jay's TS-160 lens system. Which brings us to Infinity Photo-Optical's new TS-160 kit (photo on next page). It is like a film or photo studio in a Pelican case.

Jay explained, "The TS-160 is an eventual offshoot of my patented Continuously-Focusable Microscope (CFM). I had been studying the use of afocal variation not as it previously had been for zoom lenses but rather to be able to uniquely focus—not zoom.

"I realized from working on a Hubble Telescope proposal that the Continuously-Focusable Microscope could be scaled down to much more compact dimensions. After several attempts, I invented the TS-160."

That word "Microscope" is the essence of this lens system. It is a true microscope and not an endoscope, as most ECU probe lenses are. An endoscope consists of a front lens and the image is relayed through the tube. The TS-160 is a a microscope where the aerial image of the front lens is magnified. As a result, the contrast, resolution and depth of field of the TS-160 are greater.

You can purchase the Macro or Micro lenses alone—helpful if you're backpacking all your gear into a far-off location. But for studio and regular location work, it's the kit you'll want, to achieve almost any extreme focus work the most imaginative of directors or art directors can conjure up.

Use the Macro Pro up to a distance of 1.25" as a 4x macro lens or use it as a long lens, equivalent to 135mm, for portrait work and much greater depth of field than you would normally get with a regular cine lens.

Use the Micro HM lens to fill the frame up to 16x magnification with an object as small as two of the letters in this sentence.

Macro Pro Lens

Micro HM Lens

Infinity Photo-Optical TS-160: Microscope Technology meets Cinematography

Macro Pro provides more depth of field than probes or other macro lenses. Photo by Nicholas DeSciosce.

Try the SFX-1 as a 100mm lens with astonishing depth of field from 20 inches to infinity. The companion SFX-2 is a 50mm lens that is sharp to 6 inches when focused at infinity. And the SFX-3 holds focus from 2 inches to infinity.

There are 90-degree and 45-degree prisms to hover over your mounds of extremely close coffee beans and other tabletop shots.

Attach the Double Aspheric FlipR to erect an inverted image. All these lenses are modular and easy to connect.

Coming soon: DippR plunges into liquids and stays clear because of its hydrophobic front that does not retain water.

For more information, go to: *ts-160system.com*
or Infinity Photo-Optical's home page: *infinity-usa.com*

TS-160 Lens System (Studio in a Pelican Case)

PhotoCineRent Mattebox and Filters for FUJINON 25-1000

The FUJINON Duvo HZK 25-1000mm f/2.8-5.0 is a Super35 format, PL Mount box lens with a 40x range and 1.5x extender).

Albrecht Gerlach is the owner of PhotoCineRent, PhotoCineShop and PhotoCineLive. They have a bunch of these lenses.

Albrecht discusses their new accessories for the 25-1000 zooms:

The Fujinon 25-1000 is an ideal lens for what we do. For quite some time, we have specialized in big multicam shows—music or fashion. The zoom range and ability to go to such a long focal length with a wide aperture and high quality was missing up to now.

But, DPs were a bit skeptical about that 25-1000 lens because you couldn't put filters on it. We had already figured out how to adapt cine-style focus pulling on these lenses with ARRI Hi-5 lens controllers. You can focus-pull these lenses quite nicely now. But the filter thing was still an issue because on many of our big shows, the DP wants a ¼ or ⅛ Glimmerglass, or a Hollywood Blackmagic on everything. And if you can't put it on the lens, then that's a problem and they'll use something else.

Of course, Tiffen is now making rear effect filters for the 25-1000. But the one thing you could not do with a rear filter is rotate a circular polarizer. And then along came Philippe Bordelais, legendary Steadicam operator and owner of Abracam. He makes amazing products. His 3D-printed carbon fiber composite matte boxes are very popular with Steadicam and handheld camera operators, and anybody else who needs to have a very lightweight matte box. They're very high quality and have many useful features.

Philippe designed and manufactured the Abracam ClipOne 6x9 matteboxes for us. They accept regular 6.6 x 6.6 filters. You get a bit of vignetting from 25 to about 45 or 50mm focal lengths. Normally this is not even a problem because those lenses are usually used on the long end, from 600 to 1000 mm. But clearly, we wanted filters that could cover the entire zoom range. That meant a new reference: 6" x 9" filters. To be precise, they are actually 6.6"x 9.0". Tiffen and Schneider are providing filters in those sizes. They are quite expensive, but they are custom made. The popular grades are 1/8 and 1/4. You rarely need to go higher than those grades. It's just a subtle effect that's needed most of the time.

And now, with this design, the front filter is very close to the actual front element of the lens. It works extremely well with a 9" circular polarizer. And we can motorize it with an ARRI lens motor. The operator can rotate it with an ARRI OCU-1 (Operator Control Unit). Or, the vision engineer in the OB truck can also take control of the polarization filter. This is especially helpful if you have to match multiple cameras.

There are additional venues that could benefit from the 25-1000 with 9" polarizers: LED walls and active backgrounds, or to reduce glare in sporting events with water or snow, and Olympic events.

You might ask, why not use the Tiffen rear filters for effects. You can. But very often, in pre-production, the DP wants a choice of filters and the ability to change them during the show. A lot of times, they actually stay with one filter and they don't swap them, to be honest. It's more the possibility of being able to change the filters that counts. Sometimes it's just five minutes before the show and the DP decides we're not going to have diffusion. Imagine, you're the operator or assistant and it's just impossible to get the rear filter in and out that quickly because you'll also have to adjust the back focus of the lens as well. With the front filter, it's just a matter of getting that tray in and out from the front of the lens.

PhotoCineRent & Abracam ClipOne 6x9 & Filters for 25-1000

PhotoCineRent/Rent/Shop/Live Abracam ClipOne 6x9 mattebox

Philippe Bordelais of Abracam in PhotoCineRent's checkout bays.

The top eyebrow and side flaps fold in to cover the front of the lens.

Designing the Abracam ClipOne 6x9: checking coverage and filter sizes.

There is another thing about the mattebox that is quite nice. The top eyebrow and side flaps folds in to cover the front of the lens and protects it. When you're on a big multi-cam show, you spend hours and hours and sometimes several days setting up and not shooting anything. To quickly fold the flap down and protect the lens is very helpful. This was requested by operators. It also helps protect the front element from rain, sun, and wind.

Because the 25-1000 zooms, like most box lenses, were never designed to hold a mattebox in front, the weight was a consideration. That is another advantage of the carbon fiber construction.

PhotoCineRent financed the whole R&D process. We have an exclusive with Abracam for the ClipOne 6x9 and the 9" polarizers. We have six of the 25-1000 lenses in rental right now. We're getting a few more. We also will sell the matteboxes and filters through PhotoCineShop. We already sell 4x5 and 6x6 Abracam matteboxes and accessories.

photocinerent.com *photocineshop.com* *photocinelive.com*

Philippe Bordelais talks about his work on ClipOne 6x9:

I've essentially been a Steadicam operator since 1989. I attended Garrett Brown's Workshop in Sienna at that time. For more than 30 years, I have always worked in parallel on dozens of prototypes dedicated to the Steadicam world. Some examples are my 3D Freestyle Rig from P&S Technik, UVM, DocknRoll, SledX, and the original prototype of Wave. My first 3D-printed prototype was done more than 25 years ago.

But I'm always a Steadicam operator at heart and I don't aspire to become an industrialist. I decided to work with 3D printers to be autonomous and no longer need intermediaries with whom I wasn't a winner.

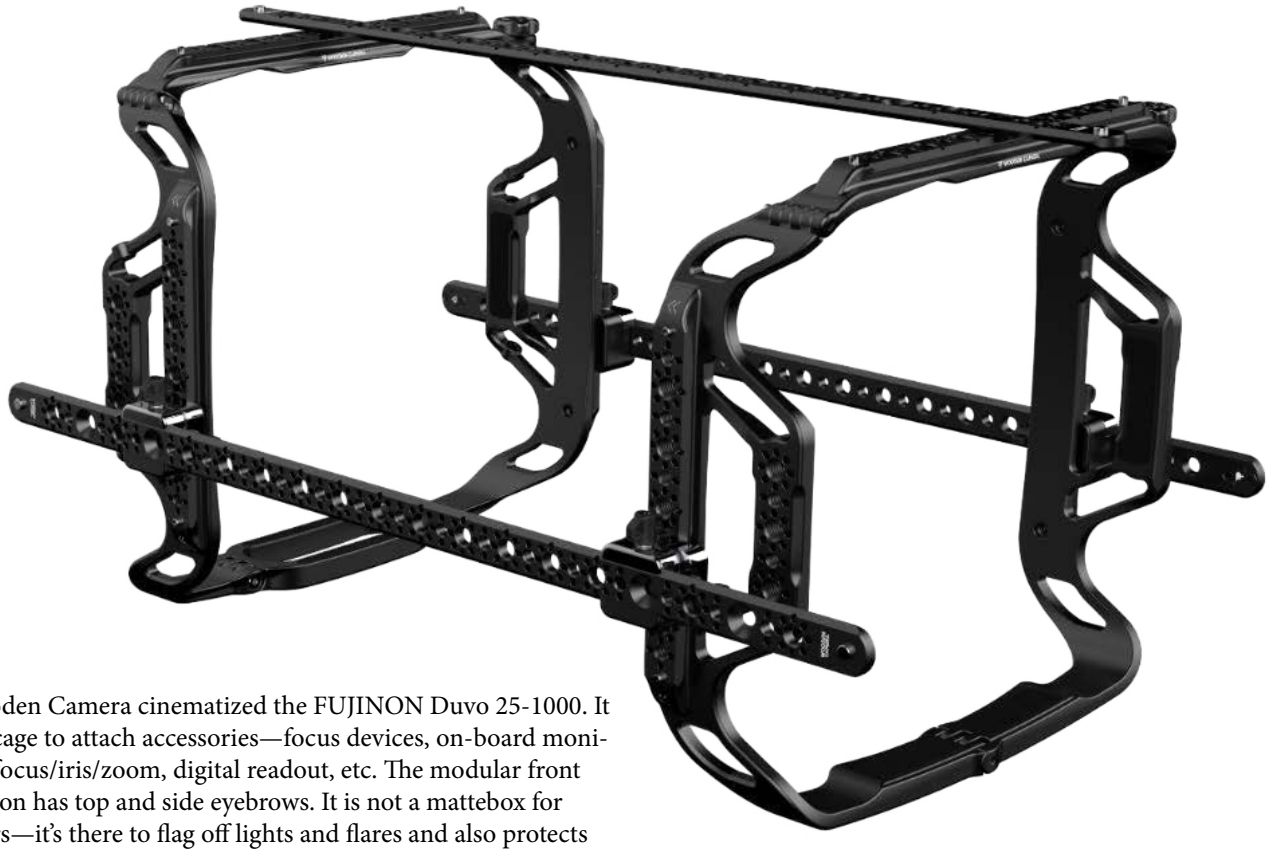
About 7 years ago, I decided to develop the ClipOne Series business of matteboxes, after having made them only for friends for a long time. When Albrecht asked me to study a mattebox for his Fujinon 25-1000 zoom lenses, I was immediately convinced that 3D printing was the best answer because it would be a limited edition and small quantity.

We quickly defined a technical objective. I like to work according to the Bauhaus spirit: form follows function. With this philosophy in mind, designs emerged very quickly—within a week—and 3D printing made it possible to realize prototypes almost immediately. On the other hand, development took much longer—in this case, we needed 8 weeks.

I was able to draw on years of experience in 3D and my knowledge of the field as a Steadicam operator to find technical and practical tips to save time on the design. One thing that motivates me is to look for new ideas and try to innovate, and I can say that with this project I've been served. I'm not interested in copying what already exists. Lately, I have had less time to work as a Steadicam operator because I have been devoting myself more than full time to making professional cine products.

abracam.eu

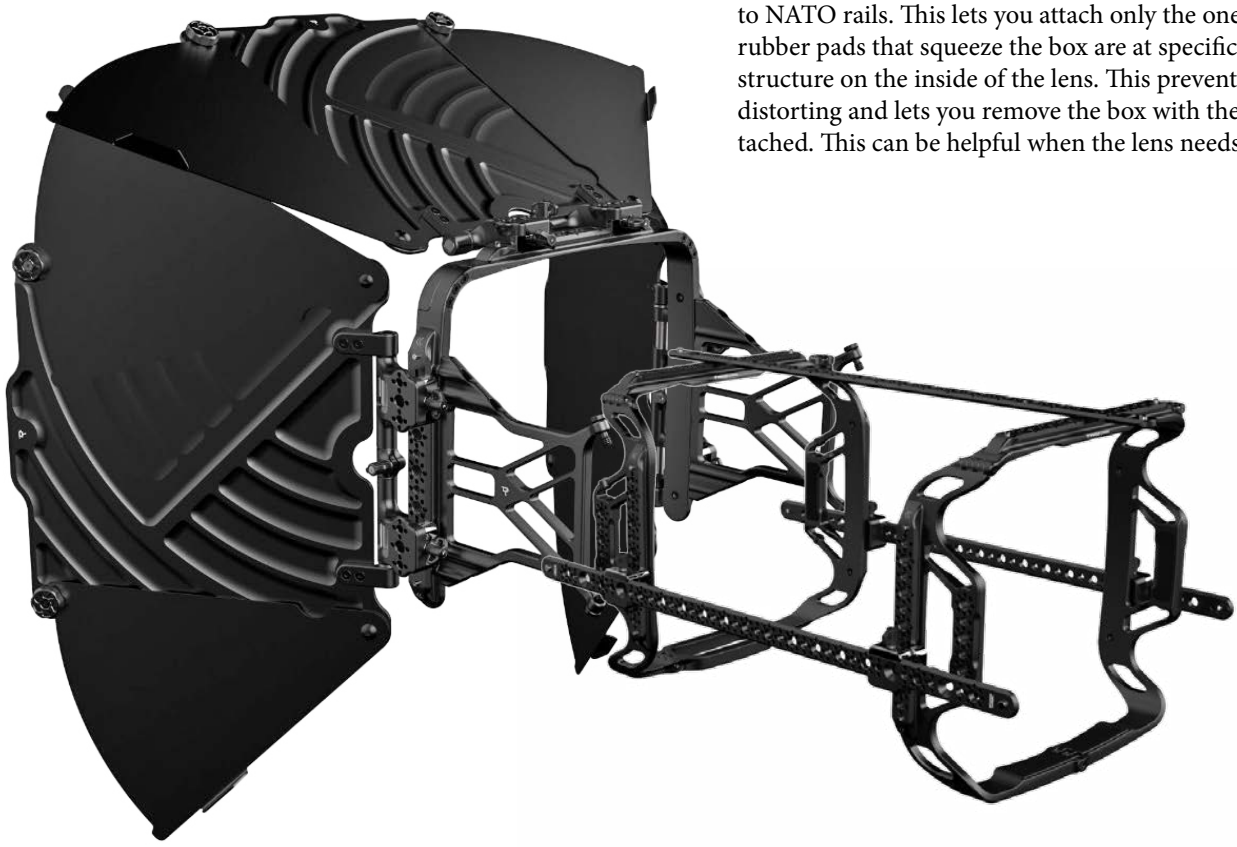
Wooden Camera Cage for FUJINON Duvo 25-1000



Wooden Camera cinematized the FUJINON Duvo 25-1000. It is a cage to attach accessories—focus devices, on-board monitor, focus/iris/zoom, digital readout, etc. The modular front section has top and side eyebrows. It is not a mattebox for filters—it's there to flag off lights and flares and also protects the front from rain and snow.

The cage attaches by compression between rubber pads and the exterior of the lens housing. There are three NATO rails with ¼-20 and ⅜-16 threaded holes and locating pin slots to mount accessories. A thumb knob lets you install or remove the cage.

Dominick Aiello, Sr. Director of Accessories at Creative Solutions, says, "The flags are machined aluminum and are attached to NATO rails. This lets you attach only the ones you need. The rubber pads that squeeze the box are at specific points that have structure on the inside of the lens. This prevents the box from distorting and lets you remove the box with the cage still attached. This can be helpful when the lens needs to be serviced."



FUJINON DUVO 24-300

Sept. 7, 2023. Fujifilm introduced the FUJINON Duvo 24-300mm T2.9-4.2 PL Mount Zoom Zoom Lens, officially named HZK24-300mm.

When they launched the Duvo 25-1000 PL Zoom, Fujinon said that additional lenses were coming.

Duvo 24-300mm has a 12.5x zoom range. It covers 24-300mm in Super35 format and 36mm-450mm with the built-in 1.5x expander/extender. It is very compact at 10.6 inches long (270.5mm) and lightweight: 6.5 lb (2.95 kg). Minimum focus from the front of the lens is 34.7" (0.88m). The front diameter is 114mm.

This is essentially a cine-style servo zoom lens, with built in servo handgrip. The focus ring has a standard 0.8M gear pitch. Zoom and iris rings have traditional broadcast style narrower pitches.

The aperture does ramp from 2.9 to T4.2 as you zoom to the longer focal lengths. This is to be expected for a lens this lightweight and compact.

The FUJINON Duvo 24-300mm has Breathing Compensation Technology (BCT) that automatically corrects focus breathing.

Remote Back Focus (RBF) adjusts flange focal distance from the control panel of the camera or a remote system.

Duvo 24-300mm is equipped with ZEISS eXtended Data lens metadata based on the /i Technology standard.

Duvo 24-300mm is currently expected to deliver in the U.S. in spring 2024. It will make its debut at IBC 2023 in Amsterdam along with a third, new, wide-angle FUJINON Duvo zoom lens that goes from extremely wide to tight portrait focal lengths: 14-100mm.

Tiffen Rear Filters for Signature Primes

The politics of behind the lens filters

On the previous pages, multi camera DPs said they want the ability to change filters quickly. On these pages, the DP may want the ability to bake in a look with filters to which you commit.

When the director on a big budget feature asks whether you can have more halation around the highlight, you could insist (in vain), "But sir, this is the look we agreed upon during prep and scouting." Don't say that. The director will be annoyed. Instead, say, "But sir, the sun is setting, and it will take five minutes or more to swap rear filters, and we will surely lose the light and miss the shot." Hopefully, said director doesn't know how fast your crew can change filters and will instead be impressed by your sense of fiscal responsibility. And of course, nothing prevents you from stacking additional filters in front.

Tiffen Magnetic Rear Filters for ARRI Signature Lenses

Offering new looks and additional style, rear effect filters from Tiffen complement ARRI Impression Diopter-Filters for Signature Primes and Zooms.

Tiffen Magnetic Rear Filters for ARRI Signature Prime Lenses are now approved, tested and authorized by ARRI. They come in a large choice of Tiffen looks and in grades: Black Fog, Night Fog, Black Pro-Mist, Antique Black Pearlescent, Antique Pearlescent, Antique Satin, Smoque, the ever-popular Glimmerglass and more. As with front-of-the-lens filters, Tiffen rear filters come in a choice of grades from 1/8 to 2.

Why is this so good?

When mounted on the rear, you can use one strength, for example ¼, on the entire range of focal lengths. You do not have to change strengths depending on how wide or tight you are.

This is different from when you add a filter to the front of the lens. Hopefully you use a heavier grade for wide angles (maybe ½ or 1) and a lighter grade for tighter angles (maybe ⅛ or ¼).

The reason for the uniform grade is telecentric design. On the Signature Primes, the rays that emerge from the rear of the lens are parallel, no matter whether you are wide, medium or tight. Also, none of the Signature Primes have rear elements that protrude through the rear of the LPL mount.

Magnetic mount

There are 12 magnets at the rear of ARRI Signature Prime Lenses. You probably already have ARRI net holders that attach the same way. Now, you can swap rear magnetic filters quickly and creatively.

Have we seen this before?

ARRI recently introduced eight Impression V filters—essentially plus and minus diopters for the rear. Now, Tiffen Rear Filters complement your selection of choices to define new looks.

Tiffen also makes rear filters for Angénieux Optimo Primes.

But why have we mostly used gels and nets in the past — and not glass filters — behind the lens?

As they say in Shakespeare in Love, "It's a mystery." Jon Ercole, AC Extraordinaire, used to call them "BLT" (Behind Lens, The) nets. Nets were lightweight, mysterious, drove rental houses mad when you used nail polish to attach them (3M "snot tape" a wiser choice), and stockings for nets were fun to shop for at Fredericks of Hollywood (Fogal Noir a favorite).

Tiffen Rear Filters for Signature Primes

But now, Tiffen magnetic glass Rear Filters provide even more, and more repeatable, ways to define eras, distress, distort, augment, vintagize, glow, streak, flare, halate or deconstruct the image that the original lens designers spent years perfecting :) But now, Tiffen magnetic glass Rear Filters provide even more, and more repeatable, ways to define eras, distress, distort, augment, vintagize, glow, streak, flare, halate or deconstruct the image that the original lens designers spent years perfecting :)

What about shims?

Remember that flange focal depth changes by about ⅓ the thickness of a filter at the rear of the lens. Tiffen glass rear filters are approximately 2mm thick. So, you can add an approximately 0.6mm shim for a Signature Prime with rear filter — effect or clear. Tiffen is working on these shims.

If you just want a quick try-out without shims during prep, just mark your own focus scale with chart tape. That's how FDTimes did the tests on the next page.

Tiffen Rear Glass Filters for ARRI Signature Prime lenses are available from The Tiffen Company and their dealers.

tiffen.com

ARRI Camera Control Monitor CCM-1

ARRI Camera Control Monitor CCM-1 with familiar Page OS Live View and Interactive Status Display.

Familiar ARRI Home Screen

Familiar Deep Dive Menu

If you have an ARRI ALEXA 35 or Mini LF, then an industry-standard SmallHD Cine 7 Monitor was probably perched on top. But you yearned for dedicated ARRI features and camera control.

Now you can. ARRI and SmallHD partnered to develop the new 7-inch CCM-1 (Camera Control Monitor).

The CCM-1 provides a pristine image on a much larger display than the MVF-2 viewfinder. It also gains access to all camera menus and settings, making it a legitimate alternative for full camera control. You can select and control things by touching the touchscreen or by using the joystick and navigation buttons.

- Resolution: 1920 x 1080.
- Pixel Density: 322 ppi.
- Power Input: 10 - 34 V DC via cable.
- Display: Touchscreen TFT LCD with LED backlight.
- Active Screen Size: 5.94 x 3.7" / 151.2 x 94.5 mm.
- Overall Dims: 7.36 x 4.72 x 1.14" / 187 x 120 x 29 mm.
- Brightness: up to 1300 nits.
- Menu button and 4 user buttons on left side.
- Power, joystick, back button and lock slider on back side.
- Color space: DCI-P3 and Rec. 709.
- Weight: 1.31 lb / 594 g.
- Connectors: VF, 3-pin Fisher PWR, 3G-SDI BNC IN, 3G-SDI BNC IN/OUT, Headphone 3.5mm port, USB 5-pin (to control ALEXA Mini LF via Ethernet Adapter), USB-C (to load firmware updates, look files or to export framegrabs.
- ARRI ¼-20 Pin Lock—on top, bottom, rear, and right side.

Here are several connection scenarios.

1. The CCM-1 connects directly to the camera's VF port. This is the same connector where you'd normally plug in the MVF-2 viewfinder. One single VF cable can deliver power, video, audio and control commands, up to 100 nits—useful as a menu or for viewing in dark places.

2. If you want both the MVF-2 and a CCM-1 on board an ALEXA 35, the MVF-2 plugs into the VF 1 port on the front left of the camera. Then, run a second VF cable from the VF port of the CCM-1 to the VF 2 port at the right rear of the camera. Power the CCM-1 from a 12V or 24V accessory port on the camera to the monitor's PWR IN port—and you'll get a dazzling 1300 nit image. (This requires upcoming ALEXA 35 SUP 1.2.1.)

3. The ALEXA Mini LF only has one VF port. To run both the MVF-2 viewfinder and the CCM-1, the CCM-1 can be connected to the camera's SDI output as a standard SDI monitor, with an added Ethernet cable for camera control.

4. For cranes, car rigs and remote heads, CCM-1 can be tethered with a 33' (10m) VF cable.

The CCM-1 housing is machined from aluminum, with two replaceable pin-lock inserts.

It works in two familiar ways: ARRI style or SmallHD Page OS mode. ARRI style has a home screen familiar to users of ALEXA cameras, with a menu that's identical to that of the MVF-2. The same status overlays appear around your live image, but now they are interactive, so that you can change your FPS, Shutter Angle, EI, Internal FSND and WB while seeing the effect that they have on your picture. The PageOS user interface is similar to most SmallHD monitors. Its ever-popular page-swiping paradigm shows a live view of the scene along with user-designated overlays.

There are 4 user buttons to summon up your favorite settings. The lock slider disables the touchscreen and all buttons, preventing calamities on set.

A playback screen is available via the menu or assigned as a user button. The clip list on the playback screen shows metadata.

Everyone's favorite is the CCM-1 sun shade (official name is sun

ARRI Camera Control Monitor CCM-1

hood). It attaches to the CCM-1 without any tools, clips or Velcro. Its top and side flaps fold flat over the screen and are held open with magnets. A matte black microfiber fabric on the inside prevents reflections. It also protects the CCM-1 display when folded flat and protects the screen if unceremoniously (gasp) thrown into a ditty bag. Of course, the CCM-1 has been lovingly placed inside the zippered neoprene pouch that comes with it.

A two-axis MAC-1 monitor bracket is included with the CCM-1. Many monitor brackets droop off level. Not this one. It tilts forward - backward without listing off-horizon when mounted on top of the camera. It has an adjustable friction knob for one-handed repositioning and inserts for different mounting standards.

Alternatively, the new Viewfinder Adapter VFA-4 can be attached with the same mechanism as the MVF-2, and swung in and out like a large flip-out display.

The CCM-1 is shipping now. It pairs with ALEXA 35 SUP 1.2 and ALEXA Mini LF SUP 7.3 software update packages.

CCM-1 comes with:

- Foldable Sun Shade
- Screen Protector
- Zippered Storage Pouch
- MAC-1 Monitor Bracket
- VF Cable 1.5 ft / 0.5 m
- RS 3-pin Fischer Power Cable 1.6 ft / 0.5 m

arri.com/ccm-1

Fred Merten, Sean Dooley & Greg Smokler on CCM-1

Fred Merten, Product Manager Camera, explained how the CCM-1 came to be.

"Over the years we've had constant requests for a monitor with control functionality, especially for small and light camera setups, and I really think the CCM-1 ticks all the boxes for that. In addition to minimal setups, it's ideal for many special applications, such as cranes, car rigs, and so on, where you need full control at a distance. Plus, it works really well in tandem with the MVF-2, so both DP and AC can have access to settings and their own custom user buttons. Customers are always asking for more user buttons and more SDI outputs in the camera, and the CCM-1 is an easy way to free up an SDI output for a monitor feed.

Sean Dooley, Product Marketing Manager at ARRI Camera Systems, unfurled the clever, collapsible CCM-1 cover and explained (with a twinkle in his eye):

"The monitor is fine. It's a fantastic product. But the best part of the whole deal is this fantastic new sun hood. It is like an iPad cover with magnets and it is both rigid but soft. It doesn't use Velcro or straps or anything. It just snaps on to the front of the monitor with two little clicks. And then, when you want to put it away, it all folds beautifully flush on top of the monitor so that you don't scratch the screen and it's really flat and you can just put it in your kit bag. Or you can fold it flat against the top of the top handle and put it in your bag and run away. The cover comes with all of the monitors. How magical are those magnets?"

Greg Smokler, VP of Cine Products at Creative Solutions, said:

The new CCM-1 Camera Control Monitor combines the iconic and familiar ARRI menu interface, with SmallHD's powerful video processing, tools, and PageOS operating system. All of the versatility of PageOS is present, but this is a custom monitor for ARRI; anyone who is familiar with ARRI cameras will start using the monitor and immediately understand the specific and nuanced ARRI user interface cues.

One of the most brilliant parts of this collaboration for me, was seeing how the designers from ARRI approached the way they envisioned a user operating their camera via this monitor interface.

I was really delighted by the evolution of all of the elements of this system from the industrial design to the way it's mounted, and certainly the user interface. At SmallHD, we are quite wrapped up in our PageOS architecture and all of the structures that we have developed within it. It was refreshing to see, from a new perspective, how the teams at ARRI — with all their knowledge and user feedback—approached the design of the monitor.

At Creative Solutions Cine, our goal is to outfit cameras to provide a visible yet invisible shooting experience for the camera crew. In other words, we just want to make gear that works elegantly and unobtrusively. It is a conversation around the design of the whole system of the camera. And design comprises how things look, but also how they work.

It was an amazing experience to work with ARRI, a company that has over a hundred years of commitment to cinematography. And this monitor has all of the hallmarks of a component of an elite camera system, a camera system that ideally gets out of the way so that the cinematographer, camera operator or camera assistant can focus on their essential jobs, which is to get the shot.

Neill Blomkamp on Directing *Gran Turismo*

Director Neill Blomkamp, David Harbour and Archie Madekwe (L-R) with pod car on Columbia Pictures *Gran Turismo.*
Photo by: Gordon Timpen ©2023 CTMG. Courtesy of Sony Pictures Entertainment Inc.

Jon: How did you and Jacques Jouffret wind up working together on *Gran Turismo*?

Neill Blomkamp: There's something about Jacques—his visual style and technique felt extremely congruent with the way I work and the way I like my film to look. That approach consists of creating a real, living, breathing sandbox of light that you let the actors inhabit without getting in their way. It becomes almost like a documentary setting where the camera can go anywhere and it's much more fluid, much less structured, and you're prepared for any outcome.

That also means being okay with actors dropping in and out of pools of lights and basically making it a little bit more documentary and a little bit more real. That's on one end of the spectrum. On the other end of the spectrum, it is about looking for very cinematic, beautiful moments when you can find them. Jacques fundamentally works that way and understands that approach. I'm very pleased with what we shot on the movie because it's executed exactly that way.

Would you call it a cinéma vérité style with many cameras?

Almost. On our biggest day, I think we were shooting with 22 cameras. It's close, but not quite cinéma vérité, because we were not using natural light. Everything is lit. It's meant to be beautiful.

I spoke with Jacques a lot about putting down dolly track and using very precise shots in certain moments, and then being willing enough to crosscut with very loose handheld photography. We have both of those styles of cinematography running on the same timeline. It seemed to cut seamlessly.

How did this project begin for you?

Being very involved in video games and also loving cars, I felt interested in the project, but I couldn't imagine how you would make a film out of what is essentially a racing simulator. It just didn't make sense. But that's because I didn't know the amazing true story about the GT Academy and all these kids who graduated from it—taking virtual sim races and having them actually compete as real professional race car drivers.

When I read the script, I realized that the approach would be to view *Gran Turismo* within the setting of the real world. In other words, you were not within the narrative of the game, which is what people think video game films usually are.

I assume you're a reasonably technical person, having done VFX, commercials and features.

I would say that I'm fairly technical. As time goes on, I definitely find myself far more interested in story, tone, theme and character. I'm also very obsessive about imagery. But, if someone says the VENICE 2 is going to have really good ability to shoot in low light conditions, that's all I really need to hear; I don't need to get any more technical. I would when I was younger but now I don't.

How did you establish the look, the logistics and the way of working with many multiple cameras?

The goals and theory about how we wanted to approach things seemed to have worked. When you talk about the process of multiple cameras, it's one of the things Jacques and I spoke about often in the beginning. It was the idea of trying to treat each race,

At center, RIALTO with Leica Summilux-M 0.8 35mm f/1.4 and Tilta Nucleus-M wireless lens control. At right, V-RAPTOR with Panaspeed.

or actually any scene in the movie, as if it were a real event.

If you were invited to an F1 race or a GT3 race and you could bring a ton of cameras, what would you film? I kept saying to Jacques that when I got into the edit bay, I wanted an overwhelming amount of footage from unique and multiple angles, with different perspectives, so that at any point on the timeline, I could choose to go anywhere I wanted to go.

The reason for that was to create the feeling that the events were undeniably real. What happens often in film is the sense that you design a stunt, a moment or an event, and it feels constructed because it was only captured from one perfectly pre-visualized angle. Then, you look at films that we used as references, like *Any Given Sunday* or *Friday Night Lights*, where the cameras happened to catch something rather than having one expertly-placed camera for one epic moment, and that was the only angle that ever existed, which is exactly what I didn't want.

One of the films that I started off thinking about was *Moneyball* because it was to some degree a sports movie, but had an incredibly real color palette and the lighting never felt synthetic. If you then think from a production design standpoint, automobile racing is very colorful, very poppy. So you lean on production design to have the cars stand out and be colorful. You ask the wardrobe department do something similarly colorful with the racing outfits. Then you just extrapolate from there to purposefully add in a lot of saturated colors that would never break realism but would add what I thought of as a video game layer. We never made the lighting or the environment feel fake, but we had a heightened saturation and sense of something that was a notch above. It's a fine balance.

We pretty much delivered on that. Let's have four drones in the air in four quadrants of the track. Each drone team has one quadrant, that's four cameras. Then, let's have an aerial drone that's not an FPV to do more cinematic shots and be anywhere over the track. So that's five cameras. And then we'll have a camera pursuit car that has a camera facing forward and a camera facing backwards that can drive in amongst the rest of the cars. That's two more cameras. Then you have ground-based cameras, and a pursuit car with a Russian arm on it, and cars with camera operators inside some of them shooting either the drivers or shooting out of the windows. And then you layer one thing on top of the other until you get to a place where you're wondering which cameras are shooting other cameras. And so, you realize that you can't have the drones and the Russian arm on the track at the same time because the drones will see the Russian arm. And if you have the Russian arm, what cameras are permissible in that setup? You just start breaking it down that way. As I said, we maxed out with about 22 cameras that provided 22 streams of simultaneous angles in some of the races.

How did you and Jacques decide on shooting with VENICE?

The reason for Sony VENICE was really the RIALTO. The idea was to be able to detach the sensor block from the camera body. I would say it was essential. We really didn't have a choice because the normal race cars are so confined. And the, in the third act, they race Le Mans Prototypes, called LMP2. Those are even more claustrophobic. It's just a perspex bulb around the single occupant vehicle. You literally have no space. The only way was to put a bunch of sensor blocks in this incredibly cramped space with the driver. To some degree, that dictated the camera system we had to use. It came with other benefits. It's just really good in a lot of different lighting environments. Ultimately, that is how we ended up.

Jacques Jouffret, ASC on *Gran Turismo*

Jacques Jouffret, ASC in helicopter.

VENICE 2 RIALTO with Leitz M0.8 50mm Summilux-M and Tilta Nucleus-M.

Jacques Jouffret, ASC discussed* Gran Turismo *at NAB.

Jon: What attracted you to this film?

Jacques: What interested me at first was the fact that it was a real story. I was not particularly interested in a computer game. I could sense right away that Neil wanted that as well. The other thing I noted from him was using multiple cameras. That was very important to me. He wanted a very loose style, with loose cameras.

How were you able to get so many RIALTOs at a time when they had not yet even been delivered?

They were prototypes and first I had to convince production that I was going to use those small camera heads. Actually, something very good happened for us—Sony wanted me to shoot a proof of concept test to demonstrate the way we were going to do it. I had two weeks to start prepping this proof of concept. Then I said, "Okay, I would like six Sony VENICE cameras and Rialto extension systems.

Did you shoot virtual backgrounds?

No, it's all real. There are no visual effects. I sensed that Neil wanted to try something different. I knew of his science fiction films *District 9* and *Chappie* which had lots of visual effects. And here we were, doing this very real project where he didn't want to do special effects. I think Neill was interested in my work because I did lot of action films, with lots of multiple cameras, and I guess that's why he was going into that direction.

Seth Emmons at Leitz subsequently talked with Jacques and shared that conversation with FDTimes.

Jacques: From the beginning, the most important thing for Neill was to have a documentary feel because it is a true story. We talked about earlier racing films like *Le Mans* with Steve McQueen and *Days of Thunder,* but this was a very different type of animal. Neill always wanted to shoot it in a very real and simplistic way. We would shoot at the actual locations and race tracks where these races took place and not use any artifice or visual effects, all real speed on a real track in a straightforward fashion. Two of the main things we considered with framing and camera mounting was conveying the speed and violence of these cars.

These cars are extremely fast. When they are at full speed doing 200 miles an hour it's super hot inside the car and they're bouncing and vibrating all over. Nothing is smooth or easy, so we wanted to show that. It's challenging to do, but one way we did it was by keeping all of the exterior shots from the camera car low to the ground, just a few inches above the tarmac. When framing, we included very little sky because it doesn't give you a sense of speed. Instead, we focused on the tarmac, the wheels, lots of debris, all things that help the viewer feel the speed.

We didn't stabilize the car-mounted shots and also removed all the stabilization from the remote head on the camera car. Most people don't see just how violent the sport is. We wanted that to be visceral for the audience. These cars vibrate like hell and if we stabilized the shots you would lose that very important element of the race.

Car mount: VENICE 2 RIALTO, Leitz M0.8, Tilta Nucleus-M lens motors, etc.

What were your camera and lens setups?

During the racing scenes, we used 6-7 Sony VENICE cameras, 3-4 RED KOMODOs, and 3-4 RED V-RAPTOR cameras, all in various positions and configurations.

We used real race cars so space inside was very limited. Our main cockpit setup was three Sony VENICE cameras with bodies mounted in the back of the car and the RIALTO extensions using Leitz M 0.8 lenses inside the cockpit: one in the center, one to the left, and one to the right. For editing, this allowed us to cut back into the cockpit on the correct side depending on where the previous shot from outside the car was coming from. On the outside of the car, we hard-mounted cameras to get that feel of the road and the wheels, as well as a camera facing forward to capture cars passing in front, and one pointing behind the car.

For a camera vehicle, we ended up rigging up an actual GT3 car that we found in the UK. It was the only way to keep up with the real cars going 200 miles per hour. We had a great driver who was somehow able to keep up even with a whole bunch of cameras on his car. It was a lot of extra weight.

We were running three different types of cars: GT-R, GT3, and eventually the LMP2 car at Le Mans. We added pods on top of each one so that a real race car driver would be driving from on top of the car with Archie Madekwe in the cockpit.

We had three drone teams: two using FPV drones flying KOMODOs with Leitz M 0.8 lenses and a heavy lifting cinematic drone with a V-RAPTOR and M 0.8 lenses. They were spread out at various sections of the tracks to pick up the action. We also had cameras with long lenses in different places.

We shot everything Full Frame, full sensor with a 2.40:1 extraction. The KOMODO was Super35 but the VENICE 2 and V-RAPTORs were shooting 8K. Putting everything together worked really well. There weren't any problems matching camera formats.

How did you end up making your lens choices?

I had decided I wanted to use the Panaspeed lenses for the dramatic scenes, but I was having a problem with the cramped cockpits of the cars. In my talks with Panavision UK, I said, "I need you to give me a very, very compact lens." And they told me, "Why don't you try the Leitz M 0.8 lenses." My first thought was, "Bingo!" It was that kind of moment. The form factor is perfect. They're f/1.4, Full Frame, and the Leitz M adapter for the RIALTO is extremely small.

As for the character of the lenses, they have a portrait feel with great depth and a center-weighted image. Inside the cockpit, I was just interested in the driver, so it was a perfect match. I used some diopters screwed into the front of the lens to bring the minimum focus to where I needed it to be, which I loved even more because it gave me a little more sense of depth, a little bit of distortion, and a bit more character.

The other thing that is great about the M 0.8 glass is that it blends very well with all the other lenses I used. I had the long the Angenieux Ultra 12x 36-435mm zoom and the Panavision Panaspeed lenses, as well as two or three different zooms from Panavision. That was my full lens package.

I actually purchased a set of M 0.8 lenses for myself after the film. I fell in love with the form factor. The quality of the glass and the fall-off is simply fantastic. I'll carry them in my package on every movie now.

Tilta Nucleus Nano II

Tilta Nucleus Nano II Wireless Lens Control Kit includes:

- Nucleus Nano II Hand Unit Controller
- Lens Motor
- USB-C Power Cable (11.8")
- Lens Ring Adapter
- 15mm Rod (4")
- 15mm Rod Clamp Adapter with 1/4"-20 Screws
- Allen Key
- Carrying Case

Tilta Nucleus M wireless lens control systems worked on *Gran Turismo,* as shown in pictures on the previous pages. Leo Holba, Director of Focus (A-Camera Focus Puller) said, "Our VENICE RIALTO cameras had Tilta Nucleus M wireless systems to set the stop, set the focus—because the cockpits on the cars are so small, when you've got someone sitting there in a bucket seat with the harnesses and the helmet, fiddling around with your fingers to set the stop became impossible. So then it was a, okay, how do we get around this? And the answer: Nucleus M lens controls. The motors were strong enough to hold the settings. Then, it was: press record, off it goes, does five laps, comes back, press off."

Now Tilta has a new generation of wireless lens control.

Tilta's new Nucleus Nano II is an ultra compact wireless lens (focus, iris, zoom) control system. It is especially nimble on hybrid still/video mirrorless cameras, gimbals, cars, drones and rigs.

The Nucleus Nano II hand wheel has been significantly improved from its predecessor in both ergonomics and display. One compact hand unit lets you control two lens motors. The knob can follow focus and the rocker can adjust iris or zoom.

The rocker is dampened so you can elegantly feather zoom starts and stops.

Add the optional Multi-Function Power or Control Handle and the Nucleus Nano II can manage up to 4 lens motors: focus, iris, zoom, Ronin or Mirage VND.

The new 1.6" touchscreen display is a pleasure to use. Its large read-out provides a graphic display of lens positions and intuitive navigation includes menu pages for lens mapping and camera controls.

The Nano II can adjust camera settings over WiFi or Bluetooth via the lens motor's USB-C port. Cameras include Canon, Sony, Blackmagic and more.

The lens mapping control screen provides real-time focus distance information.

The Nano II's internal battery will run the unit for 7 to 20 hours continuously. Charging is done via its USB-C or Power and Control Handle ports.

The Nano II is paired with new high-performance motors that deliver five times more torque than their predecessors. You can daisy-chain additional motors.

The Nano II is compatibile with Blackmagic Pocket Cinema Camera 6K Pro, Sony FX3, Canon EOS R6 Mark II, DJI RS2, RS3 Pro, DJI Focus Motors, Nucleus-M, the previous generations of Nucleus Nano, and more.

Tilta Nucleus Nano II

Hand Unit with Touchscreen, Knob & Rocker

Lens Motor

Leitz ELSIE 125mm T2.1

125mm T2.1 ELSIE prime from Leitz is shipping. That makes 10 focal lengths ready now: 18, 21, 25, 29, 35, 40, 50, 75, 100, and 125mm.

125 is a classic number for portraits, as is the 100.

Quick review: Leitz ELSIE lenses cover Full Frame +, from 15mm to 150mm, all T2.1. Designed and produced at Leitz Park in Wetzlar, Germany, ELSIE primes have the familiar Leitz and Leica warmth, resolution, look and smooth skin tones.

ELSIE primes come in LPL mount. As with HUGO primes, ELSIE's LPL 44mm flange depth enabled an advanced design and high performance at a reasonable price.

leitz-cine.com/product/elsie

Leitz ELSIE Specifications

Leitz ELSIE Lens	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	0.35	0.5	0.65	0.75	0.85	1.25	1.5
Horizontal angle of view, Full Frame, 36x24mm	100.4°	90.0º	81.2º	71.5º	63.7º	54.4º	48.5º	39.6º	31.0º	27.0º	20.4º	16.4º	13.7º
Horizontal angle of view, Super35, 24.9x18.7mm	79.4°	69.3º	61.3º	52.9º	46.5º	39.1º	34.6º	28.0º	21.7º	18.8º	14.2º	11.4º	9.5º
Weight (lb), approx		5.3	5.3	4.4	4.4	4.4	4.4	4.4	4.4	4.6	4.6	5.5	5.3
Weight (kg), approx		2.4	2.4	2	2	2	2	2	2	2.1	2.1	2.5	2.4
Front Diameter (mm)		114	114	95	95	95	95	95	95	95	95	114	114
Length (in / mm)		6.3" / 160 mm											
Image Circle Diagonal	46.5 mm (Full Frame / Leica Format / VV)												
Lens Mount	LPL Mount (44 mm flange focal depth) with /i Technology and LDS-2 lens data												
Barrel Rotation	Focus: 270° / Iris: 51.45°												
Focus and Iris Gears	Matched locations for all focal lengths / 0.8 M gears												
Front Filter	M 92 mm x 1 mm screw-in: 25 mm - 100 mm; M 112 x 1.5 mm screw-in: 125, 150 mm												
Rear Net	Rear Net Holder												
Focus Scales	Quick change from Imperial to Metric—just flip the focus ring												
Iris Blades / Shape	The number of blades varies to match the look through all focal lengths I Circular through all stops												

Eve M. Cohen on Leitz ELSIE Primes

Eve M. Cohen (above) was DP on the short film *Acceptable Level of Crazy*, directed by Amy Rachlin.

Eve said, "The Leitz ELSIE lenses have a lovely warmth to them and resolve beautifully. Contrast was consistent throughout the set even on the widest focal lengths. Designing lenses that perform well on a chart is one thing, but attention to real world details sets a lens apart.

"The lenses offer a clean canvas on which I could build an expressive look for this film. I used a Schneider True-Net Black 1 filter on most of the scenes. I wanted a specialty filter that added halation and chromatic aberration. The natural warp and weave of the fiber in the True Net scatters light in a way that mirrored the scattered mind of the character.

The Leitz ELSIE lenses have some fall-off at the edges in both resolution and shading, which I liked.

For certain scenes that take place in the head of the lead actress, I added a Tiffen Center Spot filter to gently accentuate these features. I like to control my entire frame, including the edges. Whenever possible I will bake in my vignettes with either lighting or optics.

A.J. Marson on Leitz ELSIE Primes

A.J. Marson (above) was DP on an indie film, *The Way We Speak*, written and directed by Ian Ebright—using Leitz ELSIE primes.

A.J. said, "Nick Schrader, owner of Videofax in San Francisco. had just received Leitz ELSIE lenses the week before and when I put them on the camera they felt like the culmination of everything Ian and I had been discussing during prep.

"ELSIEs have a resolution fall off in the corners with a slightly center-weighted look that I felt drew me into the actor's eyes. They were nice on faces and maintained that iconic Leica/Leitz look that the company is so well known for: a painterly, beautiful bokeh and spectacular three dimensionality.

"We carried a set of Tiffen Black Satin filters that I used at varying degrees of strength throughout the film. The Black Satins provided a consistent level of halation and gave the image a softer look when we needed it. I pushed our filtration to a +1 for dream sequences and went completely clean for wide shots in a theater that required VFX. I also pulled the filtration when I wanted a cleaner flare or didn't want any halation in a particular shot.

"I loved the flare quality that the lenses gave us when we wanted it, especially the 25mm. We pointed a Leko light directly down the barrel and it flared beautifully. The ELSIEs aren't like some modern lenses with coatings that you can't get to flare out.

"The size and weight of the lenses remain fairly consistent throughout the set, which allowed us to jump from a studio build to Steadicam or MōVI very quickly. We were working on a tight indie feature schedule with one ALEXA Mini LF camera body, so quick transitions were crucial and the ELSIE primes made it that much easier.

"We shot wide open for most of the movie and I don't recall ever seeing chromatic aberration in our highlights. They also held contrast nicely when wide open. I didn't see any significant veiling glare and the set felt completely color matched. The long reputation of Leitz's amazing, high performing optics is definitely still there, with just a slight tuning down to provide a bit more character. I'm very pleased with how they performed. The ELSIE lenses gave us a base that we could build upon— an excellent choice for this project."

Leica Cine 1 Projector

Far-off adventures and family trips were inevitably followed by a slide show at home. It was a ritual. Adman Mad Man Dad would set up his latest Leica Pradovit slide projector, unfurl a large retractable Da-Lite screen, dim the lights and let the show begin.

Leitz/Leica Pradovit projectors were familiar fixtures for many years. It was a given that Leitz Elmarit lenses were major contributors to the luminous images sliding in the dark.

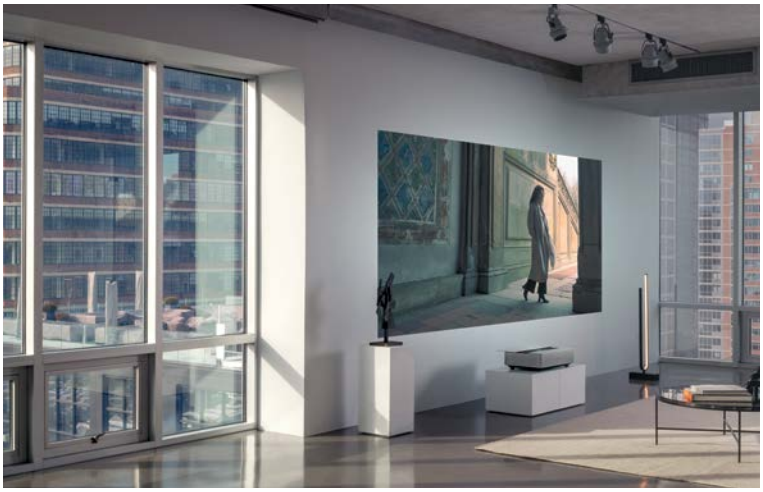
The magic of large screen projection in homes, offices, galleries and public spaces continues with the new Leica Cine 1 digital projector.

It has a Leica Summicron lens, similar in look to luscious Leitz Summicron-C cine lenses, along with a triple RGB-laser, a digital micro-mirror device system and an ultra-short throw lens. There are three models, depending on image projection size (up to 120 inches), at 3,000 ANSI Lumens, and 1,000:1 contrast ratio.

Its DLP is 0.47" 4K XPR 3840x2160, delivering greater than 100% BT.2020, HDR, HLG and Dolby Vision with Atmos audio.

Leica Cine 1 connects via HDMI 2.1, HDMI 2.0 with ARC, USB, Ethernet LAN, Optical Toslink audio, etc.

For homes, well-equipped screening rooms, museums, restaurants, galleries, offices—the Leica Cine 1 Projector and its Summicron lens will illuminate and inform your viewing habits.



Bright Tangerine KOMODO-X AKS and Misfit Kick Mk II

Bright Tangerine launches their new Misfit Kick Mk II. This updated mattebox comes with several improvements. The top flag installs in seconds. Just align the notches and tighten two large thumbscrews. A Torsion Plate spans the entire length of the top flag to absorb and dampen vibrations.

The Misfit Kick Mk II features an innovative Reveal Stage for tool-free conversion from 2-stage to 3-stage, Frame Safe clamp adapters, compatibility with ARRI components, and a lightweight yet durable carbon fiber construction. You can customize the Misfit Kick Mk II for handheld, swing-away and studio setups.

Bright Tangerine's LeftField Accessory System is now compatible with RED KOMODO-X. The main difference is the repositioned mounting point on the bottom of the camera. The original KOMODO has a screw spacing of 12.5mm; the KOMODO-X has a spacing of 25mm.

Bright Tangerine designed Base, Advanced, and Expert kits and modules for KOMODO-X, including quick release baseplates for 15mm LWS and top handles. The kits and accessories can be used with both the RED KOMODO-X and the original KOMODO, making them cross-compatible. Contact Bright Tangerine customer support for a special order washer plate that provides correct screw spacing and proper fit to the baseplate.

Misfit Kick Mk II

Baseplate for KOMODO-X

Left Field LF3 Expert Kit for KOMODO-X

Nanlite FC-500B and FC-300B

New Nanlite FC-500B and FC-300B bi-color are affordable LED spotlights that bridge the gap between the "professional" Forza Series and the AC-power-only FS Series.

The FC-500B draws 520 watts and the FC-300B draws 350 watts. They plug into AC power and battery power is planned.

The new FC Series fixtures are modular lights with separate heads and power supplies. The heads have easy-to-use onboard controls and a menu display. Bluetooth and 2.4G are built-in for direct control with the free NANLINK app for iOS and Android, and other remote control options.

Both fixtures also have locking metal 3.5mm DMX/RDM ports (require an accessory CB-DMX-3.5C-1/2 adapter cable).

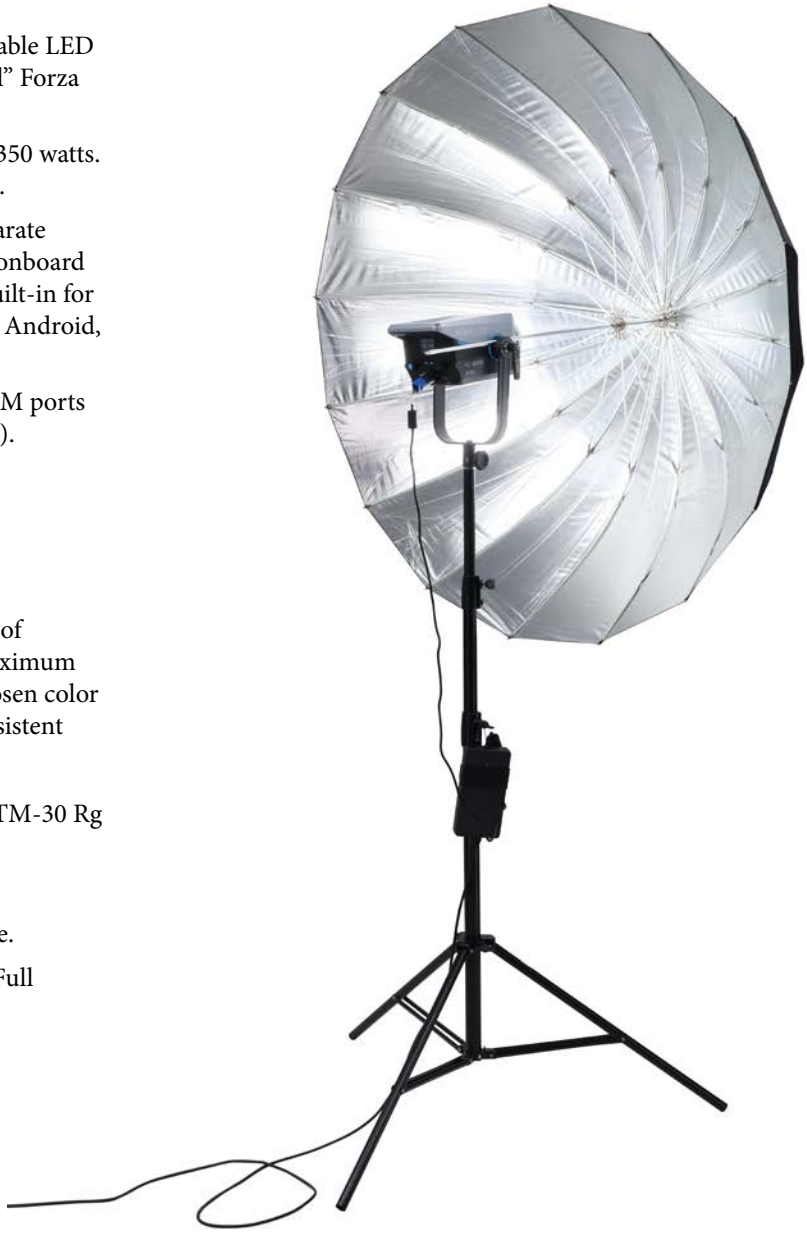
The surface of the COB has a protective cover glass.
Output specs include:

- 37,340 lux @1m (FC-300B w/reflector, 5600K).
- 65,640 lux @1m (FC-500B w/reflector, 5600K).

FC-300B/500B fixtures have a color temperature range of 2700K-6500K, with two output modes built in. The Maximum Output Mode ensures maximum brightness for the chosen color temperature. The Constant Output Mode provides consistent brightness across the entire CCT range.

- CRI/TLCI average 96 and 98, TM-30 Rf average 95, TM-30 Rg average 101/100.
- 12 built-in special effects.
- Power supply with safety strap and quick release plate.
- Adjustable fan control system with 4 modes: Smart, Full Speed, Low Speed, and Off.
- Bowens mount with an umbrella socket.
- Firmware updates via USB port on the lamp head.

nanlite.com



Ovide Smart Assist Octo 22" Video Assist

Smart Assist Octo

- 8× HD cameras or 2× 4K cameras.
- 24× SDI outputs.
- Tagged routed outputs on mini OLED displays.
- Apple M2 Studio CPU and GPU performance.
- Touchscreen: rugged, sharp, 500 nits, true color 22" 4K DCI P3 display.
- ProRes444, H.264 and H.265 recording.
- Removable SSD video drives.
- Stream live or playback video to up to 16 iPads or iPhones.
- Connects with standard Bluetooth devices such as keyboard, mouse and headset.
- Power : Mains, block or camera batteries (V or Gold mount), hot-swap and 2-minute UPS.
- Fast-and easy to setup.

Sergi Ovide Maudet is the General Manager of Ovide, a company with headquarters in Barcelona, Spain, manufacturing video assist systems and renting camera equipment.

A few weeks ago, Andrew Steele, CEO / Technical Director of EMIT in Paris called to say that they had just been appointed distributors of Ovide video assist systems in France. He introduced Sergi, who presented an interesting overview of the company and their video assist products. Sergi said:

"I studied engineering in electronics and telecommunications. My idea was not to work in the family business for a long time. But I loved it. My father has always been in this industry. He founded this company 30 years ago. Before that, he worked in a Spanish electronics company making home audio equipment. He started as an intern and kept on going. Then he left the company and ran his own companies trying to sell TVs and audio equipment. One day, he realized by accident that renting was more profitable than selling. He said, 'It's a fun thing to give someone something and when they return it they give you money and you still have the thing and get even more money for the same thing.' He realized that rentals looked like an interesting business. So he made it grow.

"In the beginning, I spent my summers here cleaning cables and then cleaning cameras and everything else. I've done every job

Ovide KOKO 10" Video Assist

KOKO Video Assist

- 10" HDR DCI-P3 Touchscreen. Sharp, super bright (1000 nits) and true color 10"HD (1920×1080).
- 12G-SDI in/out.
- Records 4× 1080p60 cameras or 1× 4K.
- Records onto removable SSD.
- Apple ProRes recording.
- No additional software needed.
- Records focus, iris, zoom, white balance, shutter, ISO, LUT metadata.
- Independent LUTs for each output.

in the company. And I'm still working here. At Ovide, I'm also very involved in R&D. About 10 years ago, we were looking for a proper video assist system and had a clear idea of what we wanted. We knew about QTAKE, the Slovakian software company which was the industry standard for video assist. But we needed a proper hardware system for it that could endure the abuse of a rental item. We cannot rent a cart with a computer, lots of Thunderbolt cables, and if you turn it on, it may not work.

And so, after requesting a trial license from QTAKE, we put all of the hardware components that we had in mind on a big table, all of the circuit boards and so on. We designed some electronics and packaged it all-in-one with a 22-inch monitor. We delivered the first unit to a production along with the rest of our equipment rental package, and then two weeks later we delivered the second one.

"Word got out and people wanted to buy our video assists. That's how our manufacturing and sales started. Actually the first sales unit went direct to New York on *The Amazing Spider-Man*. In the beginning, the Ovide Smart department consisted of Victor (our mechanical engineer and head of manufacturing), Flappi (our product manager) and me. It was as much fun as it was tough. We went through a lot together.

"Then, step by step, we hired more people and started designing more complex circuits. It was never all off-the-shelf; we kept on improving and then doing specific video boards—which we had not done in the beginning. We improved our designs, cooling, power management and packaged it all in a housing that is aircraft grade aluminum and very tough. We wanted it to be upgradeable. We wanted it to be as easy to use as possible. So we continued and have been doing generations upon generations of our Smart Assist. The Octo, which was released last year, is our latest high-end video assist. It has 8 inputs and 24 outputs. It is based on a powerful Apple M2 Studio computer.

"Our other new product is KOKO. It has a 10" super bright (1000 nits) and true color HD (1920×1080) HDR DCI-P3 Touchscreen, with 12G-SDI in/out, and it can record 4× 1080p60 cameras or 1× 4K in ProRes onto a removable SSD.

"We bought the technology of Odyssey from Convergent Design. That's the good news about being a camera rental company and a manufacturer. I was standing in one of our Prep Bays and saw an Odyssey. After navigating through the menus, I thought it was a very good start for what we wanted to do. We knew that Odyssey was not being manufactured anymore. Convergent had stepped out of the video recording business.

"And so, we made KOKO. It's ready to record in 1.5 seconds. Turn it on and it's ready. KOKO also has protection. Playback is disabled when you're recording, but you still can browse the drive, filter and get your files ready for playback as soon as you stop recording. So, as soon as you stop recording, the playback button pops up. It switches to play mode. All of this happens in 1.2 seconds. It's about 10 times faster than any other system. And it has measuring tools for the DITs such as WFM, Vector, False Color, with more to come.

"KOKO runs off a dedicated FPGA. Our larger Smart Assist products that run QTAKE software have Apple CPUs inside. KOKO does not run QTAKE. It has no OS. It's pure electronics, built from the ground up. It's much more simple than QTAKE. The electronic and mechanical designs of KOKO are 100% ours. And we do the assembly in-house."

Ovide Smart Systems have worked on *AIR, Mission Impossible-Dead Reckoning, Asteroid City, Indiana Jones and the Dial of Destiny, The Banshees of Inisherin, The Little Mermaid,* and many more.

ovide.com *ovidesmart.com*

Sebastiaan van Zuylen and Yke Erkens buy Camalot

Camalot is a cine equipment rental company in Amsterdam. It was founded in 1997 by Philippe Vié and Bernd Lesscher. They had a habit of being the first in line to buy the latest new equipment. That legacy continues today.

Since January 2023, Sebastiaan van Zuylen (above right) and Yke Erkens (above left) are the new Managing Directors and owners of Camalot, with Philippe and Bernd exiting the company. Camalot provides high-end cameras, lenses and accessories to the European market for feature films, streaming series, television dramas, commercials and documentaries. They rent a wide variety of cameras from ARRI, Canon, Panasonic, Sony and RED, and have an enviably large collection of the latest Full Frame lenses, anamorphics, vintage and rehoused optics.

Jon Fauer: Did you undertake a hostile takeover of Camalot?

Sebastiaan van Zuylen: Haha, no, it was not hostile at all. Bernd and Philippe, who started Camalot 25 years ago, wanted a change. And we've been running the business for a few years now, since around 2018. From the beginning, we had conversations about the possibility for us to one day take over the company for real. And then, on the last day of 2022, we signed the documents. Starting January 1, 2023, Yke and I are the new owners of Camalot.

Yke Erkens: Since 2018, we were entrusted with the responsibility of running the day to day business. Bernd and Philippe stepped back from the daily operations and took on more of an advisory role. We think it's a good fresh start and a new beginning with a bright future.

Congratulations. Did you buy the company?

Seb: Yes, we were able to buy it without an outside investor.

Yke: It's sort of a management buyout structure. Bernd and Philippe have been really helpful, I don't think we would've been able to do it without their help. And it's a bit crazy because I've been involved with Camalot for almost 20 years. I think it's great that Camalot continues in this way because it guarantees that the future is still there and it will continue for our business.

How and when did you two gentlemen start in this business?

Seb: Before Camalot, I studied law here in Amsterdam. I didn't really enjoy it but I stayed in school, and then Philippe offered me an internship. He said, "You can work here for six months to figure out what you want to do, but if you want to stay, you will have to do it on your own." Not many people know this, but Philippe is my uncle. Because of that, we decided early on that I would only deal with Bernd on work-related matters. So I had to prove my worth to him.

But it worked out pretty well, I stayed on and I have been here for 15 years, starting as an intern and then doing logistics, prepping equipment and getting familiar with the equipment. After a while, I realized that I quite liked this type of work. I'm here to stay. But I wanted to finish my education and got a business degree at the university while still working here.

Yke: When Bernd and Philippe started, just the two of them were working here for a few years. They bought two DVW-700 digital video cameras because they wanted to be a digital film company from the beginning. They were located in Amsterdam and there was no real cine rental company because all the television work was in Hilversum. And they wanted to go more into features.

There were a few film companies renting analog cameras. But Camalot started with digital film cameras. They grew more and more. At some point, they needed people to work for them. So they approached me. At that time I was working as a field sound engineer and I turned them down.

They then hired somebody for planning. That was Monique. But not long after that, they asked me again and then I decided, "Okay, let's try it." So I was one of the first employees at Camalot. That's how it all started. We got more equipment. It got busier and busier. Then I started to set up the technical department, which we still have and is now being run by Maarten van Waning and Pieter Minnegal.

But at some point, I found myself sort of stuck in the position I was in. I wanted to do something else. I went a totally different way.

Sebastiaan van Zuylen and Yke Erkens buy Camalot

On the Camalot boat, left-to-right: Luc Hoeijmakers, Sebastiaan van Zuylen, a pair of legs, Maarten van Waning, Hans van Grootel, Gertjan Kalff, Siew Ng, Pieter Minnegal, Susanne Bakker, Yke Erkens.

Opposite page and above, left-to-right: Yke Erkens and Sebastiaan van Zuylen.

Where did you go?

Yke: I applied for a job as an air traffic controller.

Jon: Wow. That's even more stressful than the rental business.

Yke: Yes. There was a selection process. I got through it all the way.

Seb: And you told Bernd and Philippe, "I'm leaving next month."

Yke: Bernd was really emotional about it. And Philippe really liked it. But, of course, they didn't like the fact I was leaving. It was a good one-and-a-half years, but ultimately I didn't pass some simulator tests. So, I started a DIT services company and did that for about seven or eight years. And then in 2018, I returned and they folded the DIT company into Camalot.

How do you divide up the work at Camalot?

Seb: My side is much more business-oriented and Yke is much more technical. That makes us a good team.

Yke: Seb is more the Managing Director. And I'm like the air traffic controller, except instead of being in a tower, I travel to support our jobs and sometimes I'm gone for one or two weeks.

Seb: Yke is involved with multi-cam shoots, technical matters and with the post-production side of the shoots that we do. I'm more involved in doing quotations, sub-renting and so on.

Who decides what equipment to buy and when?

Seb: The two of us together. We agree on most things immediately.

Yke: And some of the equipment is a no-brainer. When a company announces a new camera or lens, we want it. Some things are not obvious. That's the stuff we discuss. Shall we try it? Can we afford it? Do we want to take the risk?

Where do you see Camalot going in the coming years?

Seb: Right now we have a great team of 16 people. We are very happy with our mix of experience and youth. I would like to expand the multi-cam business a bit more while not necessarily sending Yke away for more weeks each year, so there might be room for improvement on that end. On the production side, everybody's still looking for how you get to the next level.

It would be great to be a part of that, see how we can make sure it grows. We are also actively expanding our operations in our Belgium office, which is being run by Gert Bauwens. For example, we now offer lighting rental as well as camera equipment in one package, which is much more convenient for our clients there.

We've also started the Camalot Diversity Grant together with the NSC (Netherlands Society of Cinematographers) to promote diversity and inclusion in the Dutch film sector. We've awarded two grants so far to two promising students, and the third one is currently being discussed. We hope other companies will join the NSC and us, so we can expand the grant to more students.

Yke: The future is how we can help people on set. And how we can help producers to take it to the next level, because my personal opinion is that as equipment gets more advanced, it can do more for you. But in the meantime, things like metadata, HDR and SDR are going to require more knowledge and more skill by people on set for the whole process to get done right.

What I would like to see is for companies to have us on board not only for the equipment, but also for the knowledge and service that we can provide. I think that the high-end rental business will continue to exist and maybe expand, but people need more and more support and knowledge.

Seb: It's about raising the bar on what we consider a high-end rental company now and creating a new level of working as a high-end rental company—and everything that comes with it.

- Camalot home page: *camalot.nl*
- For more information about the Diversity Grant: *diversity@cinematography.nl*)

Canon CN-R RF Mount Cine Lenses

EOS R5 C

EOS C70

Canon Inc. introduced their first RF-mount Cinema Prime Lenses. The new lenses combine high optical performance, familiar cinema-style 0.8M gears and ergonomics, and RF mount communication. Canon says, "The first set of seven RF Mount Cinema Prime Lenses is only the beginning. Canon plans to swiftly expand the lineup of RF Mount production equipment to meet the needs of professional content for movies, TV, and commercials."

The seven Canon CN-R lenses are: 14mm T3.1, 20mm T1.5, 24mm T1.5, 35mm T1.5, 50mm T1.3, 85mm T1.3, and 135mm T2.2. Paired with the two existing RF Mount Canon Cinema Cameras, EOS C70 and EOS R5 C, these lenses will enable RF mount protocol transmission. As with Canon CN-E EF-Mount Cinema Prime Lenses, this includes control of magnification, chromatic aberration correction, peripheral light correction and dual-pixel focus guide via camera body operations. In addition, the new lenses also correct lens distortion when paired with a compatible Canon camera.

The CN-R lenses cover Full Frame large-format sensors, have 11-bladed irises, and maintain a unified Cinema EOS color balance throughout the series for consistent color.

Designed with a pleasingly tactile amount of ring torque, the new lenses have the same gear positions relative to the mount, the same front diameter and the lens barrel rotation angles. A grippy new surface near the mount provides a comfortable surface for changing lenses—so you can twist the lens to attach it to the camera mount. You will no longer have to worry about gripping the iris ring by mistake when attaching and detaching lenses.

Deliveries are expected between January and April 2024, with the 24, 35, 50 and 85 arriving in January. The 14, 20 and 24 mm CN-R lenses will have a retail price of $4,220. The 35, 50, 85 and 135 mm will be $3,950.

Canon RF Mount Cine Lenses

Focal Length		14 mm	20 mm	24 mm	35 mm	50 mm	85 mm	135 mm
Maximum T-Stop		T 3.1	T 1.5	T 1.5	T 1.5	T 1.3	T 1.3	T 2.2
Mount		RF mount						
Close Focus - meters		0.20 m	0.3 m	0.3 m	0.3 m	0.45 m	0.95 m	1.0 m
Close Focus - feet & inches		8"	12"	12"	12"	18"	3'2"	3'3"
Close Focus Actual Subject Area	1.5:1 FF [1]	24.8 × 16.5 cm	33.8 x 22.5 cm	28.8 x 19.2 cm	20.1 x 13.4 cm	24.9 x 16.6 cm	34.3 x 22.9 cm	21.1 x 14.1 cm
	1.78:1 S35 [2]	16.9 × 9.5 cm	23.1 x 13.0 cm	19.7 x 11.0 cm	13.7 x 7.7 cm	17.0 x 9.5 cm	23.4 x 13.1 cm	14.4 x 8.1 cm
Overall Length		118 mm	125.5 mm	125.5 mm	125.5 mm	125.5 mm	125.5 mm	139.6 mm
Maximum Diameter (approx)		118.4 mm	118.4 mm	118.4 mm	118.4 mm	118.4 mm	118.4 mm	118.4 mm
Weight (approx)		1.3 kg	1.4 kg	1.3 kg	1.3 kg	1.2 kg	1.5 kg	1.5 kg
Front Filter Thread Ø		–	105 mm	105 mm	105 mm	105 mm	105 mm	105 mm
Front Diameter		114 mm						
Number of Iris Blades		11						
Lens Gear Pitch (Module)		0.8						
Focus Gear Rotation		300°						
Iris Barrel Rotation		36°						

[1] Close Focus Coverage shown for 1.5:1 Aspect Ratio is for Full Frame Sensor Area of 36.0 x 24.0 mm.
[2] Close Focus Coverage shown for 1.78:1 Aspect Ratio is for Super35 Sensor Area of 24.6 x 13.8 mm.
Focus and Iris Scales on both sides of Lens. Focus Rings available in Imperial or Metric.
Camera Right Side of lens has phosphorescent Focus and Iris Marks for improved visibility at night and in dark locations.

CVP European Lens Summit

The two-day European Lens Summit 2023 (ELS) was held at CVP's newly-renovated headquarters in Brentford, outside London, on May 20 and 21. It was produced in partnership with Koerner Camera, hosts of the ever-popular Pacific Northwest Lens Summit since 2017. With lens repair clinics taught by factory representatives, technical workshops, masterclasses, and in-depth discussions, the London event was busy, fun and educational. It provided time for cinematographers, lens technicians, camera assistants, rental houses, owner-operators, and vendors to meet leading cine optics professionals, talk with colleagues and dive deep into the technical abyss of cine lens technology. Oh, and of course the food and beverages were good and plentiful, with thin-crust pizza, barbecue and ice cream.

Seminars and workshops included: Principles of Optical Diffusion, Anamorphics, Integrated Optical Palette in Optimo Primes, Strip Down of TLS Rehoused Lenses, Dismantling Cooke S4/i, Lens Test Instruments, Lens Coverage Comparisons, ARRI Signatures Lenses, Leitz Service, Camera Checkout and Lens Calibration, Shimming Lenses, Servicing Atlas Anamorphics, and more.

CVP plans to make the European Lens Summit biannual, and to run it in alternate years to the Pacific Northwest Lens Summit. Koerner will host the Pacific Northwest Summit again in 2024 and CVP will host the next European Lens Summit in 2025.

CVP European Lens Summit and a delicious food court outside.


Center: Michael Koerner (Koerner Camera), founder of PNW Lens Summit.

Some of the best pizza outside of New York or Naples — in Brentford.

Yev Subotin getting ice cream. The Salted Caramel was amazing.


Registration and badges.

The Lens Summit exhibition hall

CVP European Lens Summit

Alanna Berkson (Preston Cinema Systems) with Light Ranger LR2M.

Steve Tiffen (CEO Tiffen), Mari Yamamura (DP) and Eren Ibrahim (Tiffen).

Tiffen Magnetic Rear Filters for ARRI Signature Lenses.

Kevan Parker (Leitz).

Randy Wedick,(CTO at Band Pro and Angenieux Americas).

Timm Stemann (Chrosziel) teaching class on TP7 II lens projector

Etienne Sauret (MYT Works) demonstrating Opti-Glide.

Etienne Sauret and Tako Saltkhutsishvili (MYT Works) with Opti-Glides.

CVP European Lens Summit

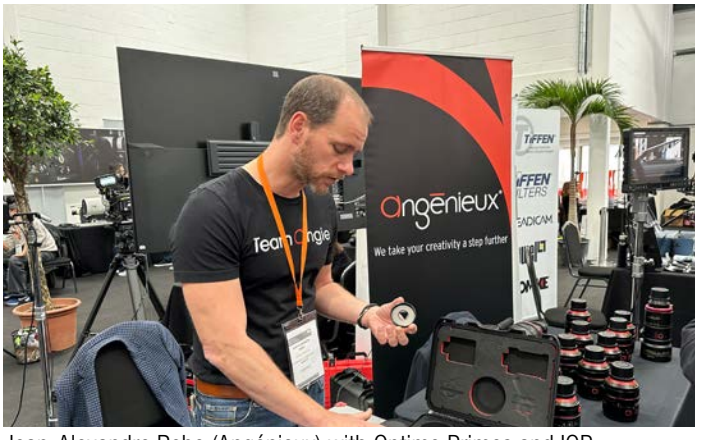
Gabriel Beanland driving among the tripods.

Gabriel attending Leitz Lens seminar with his DP Mum, Hatti Beanland.

Leitz Cine Lens tutorial at CVP. Program notes read, “A level of factory training that’s normally only available at Leitz headquarters in Wetzlar.

Benjamin Rausch (ARRI) presenting seminar on ARRI Signature Lenses and Impression V behind-the-lens creative filters.

Jenny Thiele-Wu (P+S Technik) with P+S rehoused Hasselblad.



Jean-Alexandre Robo (Angénieux) with Optimo Primes and IOP

CVP European Lens Summit

Tribe7 Blackwing7 Coffee Truck.

Ryan Avery's seminar on optical diffusion, front, mid and rear.

Phil Holland PHFX Filter Crate with Formatt Custom Diffusion Filters.

Revar Cine individual filter cartridge, magnetic stacking, fingerprint-free.

Annie Wong (Venus Optics + Laowa) and James Tonkin.

Sam Smith (SIGMA) with fp L Directors Finder and many cine lenses.

Jake Ratcliffe (CVP Tech Marketing Mngr) who does their terrific demos.

Dawn Patrol: Dawn Bochenski and friends and colleagues.

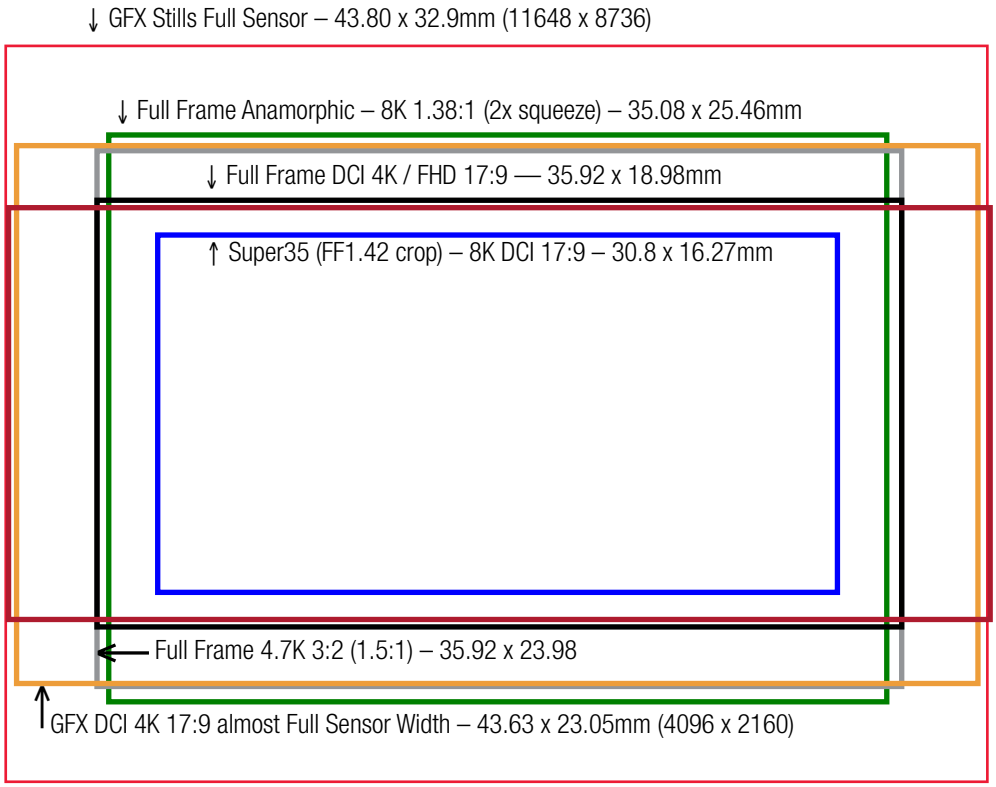
Fujifilm GFX 100II – Larger Format

GFX 100II camera body with 43.8 x 32.9mm IBIS (image stablized) sensor. Dims: 6 x 4.6 x 1.8" — 2.27 lb / 152.4 x 117.4 x 46.5 mm — 1,030 g.

9.44 million dot EVF – sharper than a groundglass
3.2-inch 236 million dot LCD, tilts up-down.

Fujifilm GFX 100II – Larger Format

Sensor Modes and Formats



The camera on loan to FDTimes has a format called GFX Cine 2.35:1 (5824 x 2478).
It fills the full sensor width.
I assume it is Cinema-Scope Widescreen, with a sensor area of 43.80 x 18.64mm.
(Height calculated as 43.80 ÷ 2.35 = 18.64).

These are just a few of the more than 32 formats and sensor modes available on GFX 100II.

Additional diagrams, graphics and details will follow online and in the next FDTimes.

Fujifilm leapfrogged from APS-C cameras to Mirrorless Medium Format (completely bypassing Full Frame) at Photokina in September 2016 with the introduction of their 51.4 Megapixel GFX50S.

Stockholm, Sweden. September 12, 2023. Seven years later, Fujifilm launches their newly designed 102 Megapixel GFX 1000II. It has enough new features to astonish even the most laconic attendees at the Fujikina launch in Sweden, land of Garbo, Bergman, Easyrig, Ljud & Bildmedia, Saab, Smörgåsbord, ABBA and, it does not go unnoticed, Hasselblad.

The new GFX 100II has stopped the presses of this IBC edition in Amsterdam. It is not much larger than a Full Frame camera. And there's the challenge. Call it "Medium Format" and you might think its 8K, 4K, FHD multi-format 43.8 x 32.9mm sensor would be smaller than so-called "Large Format" 36 x 24mm Full Frame, once known as Leica Format.

I think we should call it "Larger Format," as originally suggested off the record by a Fujifilm executive.

The printer in Amsterdam, is on the phone. "Three hours until the presses roll," he warns. With nine seconds more time to write than to watch *Oppenheimer*, here is a rapturous ode to this compact, comprehensive, cinematic camera achievement.

Larger Format Fujifilm GFX 100II comes with good timing on the recent successes of Larger Format *Oppenheimer* and *Barbie,* the former shot on analog Kodak horizontal 65mm film and the latter on digital ALEXA 65. There's something magical about going larger—in both movies and stills.

The newly developed GFX 100II sensor measures 43.8mm wide x 32.9mm high (55mm diagonal). That is about 1.7 times larger than Full Frame.

Its Fujifilm G Mount has a flange focal depth of 26.7mm with an incredibly wide inside diameter around 64.5mm. That opens up a world of almost any cine lens on the planet, which is why Fujifilm calls the GFX 100II a multi-format cine camera. In the camera's main menu, Image Format offers choices of GF, Premista (VV 46.3mm diagonal), 35mm Full Frame (43.19mm diagonal) and Anamorphic Full Frame squeezed (43.35mm diagonal)

Lens choices include at least 17 Fujifilm GF lenses, including the new 55mm F1.7R WR, 30mm F5.6 Tilt Shift and 100mm F5.6 Tilt Shift.

Attach a G Mount to LPL, PL or PV adapter, and the Larger Format world widens with more than 100 lenses that include ARRI 65mm series, Vintage 765, Leitz Thalia, Hawk 65 Anamorphic, ZEISS/ Hasselblad, Whitepoint, Ottoblad, Panavision 65 and more.

Select Premista image format in the GFX Menu for more than 319 lenses, from Angenieux to ZEISS or 35mm FF format for at least 275 lenses.

Furthermore, you do not even have to abide by the GFX 100II sensor modes. Simply attach one of more than 489 Super35 or Standard 35mm lens models and crop in post.

To misquote Shakespeare, "The GFX 100II is your oyster" and the lenses you use will be its pearls.

Fujifilm GFX 100II – Larger Format

GFX 100II with new GF55mm F1.7 R WR lens.

3.2-inch 236 million dot LCD tilts up-down.
Accessory battery grip attaches to bottom of camera.

Top view with GF55mm F1.7 R WR lens.

Full size HDMI Type A and USB-C connectors.

New Fujifilm GF Lenses

GF30mm F5.6 TS Tilt Shjft
Enormous 85mm image circle.
Up to 15mm of shift, great for architectural photos.

GF55mm F1.7 R WR — extremely fast prime lens, 11-blade rounded iris, fast autofocus.
R means the lens has an aperture ring. WR means it is weather resistant.

GF110mm_F5,6_TS Tilt Shift
Enormous 85mm image circle.
Up to 15mm of shift.

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CINEPAD · AATON DIGITAL · ORCA · matthews studio equipment · CINEMATOGRAPHY electronics · HASSELBLAD

Associate Producers

Easyrig · vocas · BRIGHTTANGERINE · Ronford-Baker CAMERA SUPPORT TECHNOLOGY · louma systems · 16X9 INC. · Panasonic · LAOWA · J.L.Fisher · Chrosziel ...the cinematographer's choice · INOVATIV · PRÄZISIONS-ENTWICKLUNG peter deutz DENZ · CS CHENG SENG GROUP IMAGE SOLUTION · INFINITY PHOTO-OPTICAL · SEKONIC · BROMPTON TECHNOLOGY · Prêt à Tourner accessories · RAID · DMG LUMIÈRE BY ROSCO · MYT WORKS BORN OUT OF FRUSTRATION

Rental Houses

CAMALOT AUDIOVISUAL FACILITIES · RVZ LOCATION · BECİNE · CAMERAS BY OTTO NEMENZ · LJUD & BILD MEDIA AB · nac IMAGE TECHNOLOGY · KOERNER CAMERA SYSTEMS · K5 FILM RENTAL · HD systems camera rental · SERVICE VISION · LITES · CINE DIVING UNDERWATER FILMING · C&L RENTAL · Lemac · LENSWORKS · PHOTO CINE RENT · ARRI Rental · MUSITELLI · AbelCine · ID-VISION MOVIE PEOPLE · sanwa CINE EQUIPMENT · sanwa PRO LIGHT · Panalight · Lensrentals · LVR TOOLS FOR YOUR CREATIVITY. · RAW · OVIDE

Media and Production Partners

cinec · AFC Micro Salon Show · fsf THE FSF DAYS · NABSHOW · EUROCINEEXPO · BSC expo · cinegear EXPO · IMAGO EUROPEAN FEDERATION OF CINEMATOGRAPHERS For the art of Cinematography · CAMERIMAGE · ICG · CineLenses · Broadmedia & Entertainment Inter BEE · AIRSTAR

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