Jon Fauer ASC www.fdtimes.com Sept 2021 Issue 110

FILM AND DIGITAL TIMES

Art, Technique and Technology in Motion Picture Production Worldwide

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Art, Technique and Technology

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Elsie Kühn-Leitz

Above: Elsie Kühn-Leitz, ca 1940.

Left: Elsie Kühn-Leitz in 1926 as a law student in Berlin.
Photos © Ernst Leitz Foundation.

A 1926 photo of Elsie Kühn-Leitz with her father Ernst Leitz II is on the cover of this edition.

Elsie Kühn-Leitz was born in Wetzlar, Germany on December 22, 1903. She and her brothers Ernst III, Ludwig and Günther were the children of Ernst Leitz II.

Ernst Leitz II managed the company following the death in 1920 of his father, Ernst Leitz (I) who had founded Optische Werke Ernst Leitz in Wetzlar in 1849. Notably, Ernst Leitz II was the one who decided in 1924 to "risk production" of Oskar Barnack's Liliput that would become the first of the famous line of Leica 35mm "Leica Format" 36x24mm still photography cameras.

Elsie Leitz attended secondary school for girls in Wetzlar and the Free School Community in Wickersdorf. She graduated from Oberrealschule high school in Berlin-Mariendorf in 1921 at the age of 17. She studied economics and languages at the Johann Wolfgang Goethe University in Frankfurt am Main and graduated with a degree in business administration from the Munich Commercial College at the age of 19. She attended the Ludwig Maximilian University of Munich, completed her law degree at the Friedrich-Wilhelms University in Berlin, and clerked at the Higher Regional Court of Frankfurt am Main.

In 1935, she married Kurt Kühn, an economist. They had three children: Knut, Cornelia and Karin. They divorced in 1948.

Elsie Kühn-Leitz completed here doctorate in law at Frankfurt University in 1936 with cum laude honors. The topic of her thesis was how spouses can shape marital partnerships in legal transactions.

She worked tirelessly on cultural and humanitarian endeavors. Her notable achievements include:

- Establishing Wetzlar cultural community activities beginning in 1945.
- Founding the Association of German-French Societies for Europe (VDFG) in 1957. She later became honorary president.
- Worked with Albert Schweitzer and Konrad Adenauer.
- Worked for the independence of the Belgian Congo.
- Honorary citizen of Avignon (1966) and Wetzlar (1979).
- 1965 Ordre des Palmes Académiques.
- 1970 Aristide Briand Medal.
- 1974 Honorary letter of the State of Hesse and the Ring of Honor of the city of Wetzlar.
- 1984 Great Cross of Merit of the Federal Republic of Germany
- Goethe plaque from the State of Hesse.

Elsie Kühn-Leitz died at the age of 81 in Wetzlar on August 5, 1985.

You may ask, why is Elsie Kühn-Leitz the cover story?

Rainer Hercher, Managing Director of Leitz-Cine Wetzlar, explains:

The story began when we discussed the naming of our lenses. Previously, we had followed the Leica tradition of naming lenses according to their apertures. Summilux-C were T1.4. Summicron-C were T2. But then, at a certain point, we wanted to honor the fundamentals that the Leitz family started in 1849 in Wetzlar.

Having the name Leitz as our brand name and company name, it was clear that we should honor some members of the Leitz family and prominent employees in the company's history.

The first time we did that was with our Henri Director/DP Finder for cine lenses that can be used as a support system with the Leica SL camera. I had been looking through some old books to learn more about the history of the company and learned about Henri Dumur, a Managing Director of the company and a great supporter of the Leitz family. He worked for Leitz for nearly 60 years and had some great achievements. You can find details about him in Wetzlar, but for the rest of the world, he is not well known. And so we wanted to honor him.

While I was researching Henri Dumur, I also learned much more about Elsie Kühn-Leitz. She, her father Ernst Leitz II and Henri were active during the Nazi times in Germany trying really hard to help their Jewish and foreign workers in Wetzlar to escape the Nazi Regime. That's how we found Elsie. She's very well known in Wetzlar and also in Germany for the work that she did. And that's when we thought "ELSIE" could be a good name for a new series of lenses. This is not only a product; this also honors a very important person.

To further honor her legacy, we have decided to donate a portion of the proceeds from these lenses to a charitable cause and have partnered with the non-profit charity Ingenieure ohne Grenzen. Translated as "Engineers Without Borders," the German-based organization works with communities in need across the globe to provide technical assistance and secure basic supplies for people in the areas of water and sanitation, energy, building and bridge construction, and others. A cornerstone of their work is partnership with local communities to adapt processes for their local conditions and create jobs by training community members to continue the work after they are done.

Rainer Hercher, Managing Director of Leitz Cine.
Photo by Tommaso Vergallo.

I think the ELSIE project is another step forward for us to offer different styles and looks for users of our lenses. Certainly, Elsie Kühn-Leitz was a lady with a strong character and we honor that with these full frame lenses whose character-driven image qualities complement the more performance-driven Leitz Primes. These lenses demonstrate a pleasing, gentle fall off toward the edges and display slightly more flaring.

The ELSIE project started two years ago. Before starting the new designs of these lenses, we spent a lot of time with Leica optical designers looking at bokeh and the defining the look of Leica M glass. We were especially interested in modeling the out-of-focus characteristics, which have always been pleasing in Leica lenses, by keeping the structure of the out-of-focus image (without going mushy).

ELSIE comes in LPL Mount. We worked long hours on this decision, noticing the trend to smaller cameras. This suggested smaller and lighter lenses. Initially, we looked at the Leica L Mount but ultimately realized that LPL was gaining ground as the next new standard. The LPL's shorter flange focal depth of 44 mm and diameter of 62mm enabled our designers to provide ELSIE with a nice balance of size, weight, optical and mechanical performance, and price as well. We think it's important to give cinematographers choices of glass. So, ELSIE is our new series of primes where we offer character and honor Elsie Kühn-Leitz.

The design objectives of Leitz Cine for ELSIE were as follows:

These full frame lenses are consistent in size and speed to serve a broad range of productions. The set of 13 primes covers from 15 mm to 150 mm, all at T2.1. They are built from scratch for cinematography and are completely produced in Germany. ELSIE lenses incorporate the warmth and resolution that Leitz lenses are known for, yet they feature a noticeable but gradual fall-off of resolution and illumination as the image approaches the corners to create a dimensionality that gently draws the viewer's eye toward the center of the frame.

A new bokeh design was developed in conjunction with Leica Camera to more closely mimics their M lenses creating out-of-focus elements to be painterly while still being recognizable.

My impressions of ELSIE after lots of lovely hours together contain a lot of L words: the look is luminous, luxurious, luscious, lovely, Leica-like. Sharp eyelashes, gentle skin tones. Great contrast, rich shadows, highlights hold, nicely controlled flares that are painterly when you want them and absent when you don't.

ELSIE Prime Lens Specifications

Actual size

Focal Length	15mm	18mm	21mm	25mm	29mm	35mm	40mm	50mm	65mm	75mm	100mm	125mm	150mm
Aperture	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	T2.1	
Close Focus (ft)	1'2"	1'2"	1'2"	1'2"	1'2"	1'2"	1'2"	1'8"	2'2"	2'6"	2'10"	4'2"	5'
Close Focus (m)		0.35	0.35	0.35	0.35	0.35	0.35	0.5	0.65	0.75	0.85	1.25	1.5
Horizontal angle of view, Full Frame, 36 x 24 mm	100.4°	90.0º	81.2º	71.5º	63.7º	54.4º	48.5º	39.6º	31.0º	27.0º	20.4º	16.4º	
Horizontal angle of view, Super35, 24.9 x 18.7 mm	79.4°	69.3º	61.3º	52.9º	46.5º	39.1º	34.6º	28.0º	21.7º	18.8º	14.2º	11.4º	
Weight (lb), not confirmed		5.3	5.3	4.4	4.4	4.4	4.4	4.4	4.4	4.6	4.6	5.5	
Weight (kg), not confirmed		2.4	2.4	2	2	2	2	2	2	2.1	2.1	2.5	
Front Diameter (mm)		114	114	95	95	95	95	95	95	95	95	114	
Length (in / mm)		6.3" / 160 mm											
Image Circle Diagonal	46.5 mm												
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 mm												
Rear Filter	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												

Blank spaces in the chart above indicate specs to be determined (TBD).

Oliver Nass on Elsie Kühn-Leitz

Dr. Oliver Nass, grandson of Elsie Kühn-Leitz. Photo: Mat Beaudet.

Elsie Kühn-Leitz with Chancellor Konrad Adenauer (31 January 1954 in Bad Godesberg, near Bonn). © Ernst Leitz Foundation.

Dr. Oliver Nass is the grandson of Elsie Kühn-Leitz. Oliver is currently President of the Ernst Leitz Foundation which was founded following the expressed wish of Elsie Kühn-Leitz by her children: Cornelia Kühn-Leitz (Oliver's mother) and Knut Kühn-Leitz (Oliver's uncle).

Oliver lives in Paris with his wife, two children and four languages. He is a member of the Board of Directors, responsible for Sales and Marketing, at the PUNCH Group, a worldwide automotive supplier of Belgian origin.

In addition to his work at PUNCH and the Ernst Leitz Foundation, Oliver is involved in a number of extra-curricular activities. He is one of the founders of the German-French Business Club in Paris. He is president of the supervisory board of the Association of German-French Societies for Europe (Vereinigung Deutsch-Französischer Gesellschaften für Europa) which was originally founded by his grandmother. As we will hear in the following discussion, Elsie Kühn-Leitz was in love with France and was intensely involved in the reconciliation process between Germany and France after the Second World War.

Remember how you were encouraged to quote primary sources in history class? Primary Sources are immediate, first-hand accounts from people who had a direct connection. There's no better connection than Oliver Nass about his grandmother, Elsie Kühn-Leitz.

Jon Fauer: What do you think about Leitz Cine honoring your grandmother, Elsie Kühn-Leitz by naming a new series of lenses "Elsie?"

Oliver Nass: I think it's a wonderful idea as my grandmother was an exceptionally courageous, strong and yet warm-hearted woman. She was not only an absolutely remarkable person in the Leitz family, but also took many still pictures, obviously with a Leica. They were mostly transparencies from her numerous journeys around the world. Her return home was inevitably followed by evening presentations, but she also projected her photos outside the family circle. She shared her impressions of the respective countries, the culture and landscapes as well as their economic and political situation, often for over several hours.

Are you involved with the Leitz or Leica companies?

My family decided—with a heavy heart—to sell their remaining shares of the company in 1986 in order to assure the considerable investment needs for the company's future development, which we were not able to fund. So there is no direct link between our family and the Leica companies anymore. I nevertheless feel a strong emotional connection and I try to stay faithful to the ideas and values of the Leitz family in my own professional and personal life.

Please tell us about the Ernst Leitz Foundation, of which you are president.

The Ernst Leitz Foundation was created in 2010 by Elsie Kühn-Leitz's children: my uncle Knut Kühn-Leitz and my mother Cornelia Kühn-Leitz, married Nass. My uncle was the fourth and last generation of the Leitz family in the company's management and also the one who published several books about the history of the company and our ancestors.

The Foundation takes care of Haus Friedwart, the Leitz family home that was built by my great-grandfather Ernst Leitz II on the Kalsmunt hill overlooking Wetzlar. The construction started in 1914, just before the beginning of the First World War, and was completed in 1917. The name "Friedwart" reflects these times of violent upheavals as it expresses the longing for peace: the meaning is "guardian of peace."

The architect was Bruno Paul, originally known for political cartoons before he became a prominent architect, interior and furniture designer. He was also one of the founders of the Deutscher Werkbund. [Deutscher Werkbund was established in 1907 as a German association of artists and designers. It was influential in the development of modern architecture, industrial design and, later, the Bauhaus school.]

Knut Kühn-Leitz at an event in Haus Friedwart. © Ernst Leitz Foundation.

Haus Friedwart on Kalsmunt Hill. Photo: Jon Fauer.

Haus Friedwart represents an early art nouveau style and is the only place I am aware of where Bruno Paul's design has been kept entirely intact. He designed not only the building, but also all the interior—including the shape of the rooms and its doors, furniture or lamps. Haus Friedwart, with its park, is a unique overall piece of art, which is also classified as a historic heritage landmark.

The first objective of the Foundation is hence to preserve this architectural masterpiece which is so closely linked to the company's and family's history. The second objective is very much linked to tradition of the Leitz family: making Haus Friedwart a place of culture and gatherings for the sake of a better international understanding. We continue to have regularly cultural events, concerts or lectures as well as guided tours which are open to the public.

I have attended Leica events and concerts at Haus Friedwart. Can you tell us more about the Foundation's cultural activities?

Cultural events and especially chamber concerts have always been an integral part of life in Haus Friedwart and it was particularly my grandmother who had an outstanding talent to convince world-renowned artists to come to small-town Wetzlar. The foundation tries to keep this tradition alive. As my grandmother used to do, we often cooperate with other associations in Wetzlar. For the future, we are also thinking of establishing a small scholarship program for young artists from the region.

Your grandmother must have been impressive.

My grandmother was an extraordinary person with a very strong character. She possessed two often conflicting qualities: on one side, she was like an artist—spontaneous, light-hearted and empathetic, loving arts (particularly music and dance) and being able to get enthusiastic even about little things, almost like a child, sometimes even a bit naïve, sometimes a bit superstitious.

On the other side, she certainly had a sharp and analytical mind, strong convictions and a high degree of persistence for ideas or projects that were important to her. She had a university degree in economics and law and got her PhD in law by the time she was still in her 20s. Her thesis was about bringing more equality to marriage law in Germany. This was quite exceptional and even more so when you put it in context of the beginning of the last century.

And very brave.

Elsie was, indeed from childhood on, a very courageous person, and so was my great-grandfather, Ernst Leitz II. [i]

There are many situations in her life to illustrate that. You may have heard that during the Nazi times she took care of the women who came from Ukraine and were forced to work in the Leitz Company. My grandmother visited them almost every day, brought them medicine and sewing machines so they could sew and repair their clothing. She brought games and played with the children, and initiated a theatre performance. All this was, of course, not at all appreciated by the Nazis. [ii]

Then she helped a Jewish lady escape to Switzerland, which unfortunately failed. She was imprisoned by the Gestapo in Frankfurt under dreadful conditions. [iii]

I'm still impressed today because I try to imagine whether I would have had her courage to reply to the Gestapo's accusations during the interrogation. She said, "I might have committed something against your laws, but I'm sure I did nothing against the laws of God, in which all people are equal, whether they are Christian, Jews or atheists." Her interrogators told her, "Ms. Leitz, you know with this sentence, you will be in trouble."

Fortunately, her life was saved by a family friend just before she was in danger of being deported to a concentration camp and a huge ransom was paid to the Gestapo.

There are other anecdotes. When the Nazis lost the war, their troops fled Wetzlar and the Americans arrived with their tanks. People were afraid that the Americans might still destroy some parts of the town. So my grandmother took her bike, grabbed a white sheet from the bed and rode up to the soldiers. She spoke English and said, "Hey, we surrender. There's nobody left here to

Meeting between Valéry Giscard d'Estaing and Elsie Kühn-Leitz on March 25, 1982 in Hanover. Photo by Oliver Nass. © Ernst Leitz Foundation.

fight. We are primarily, women, children, old men. Definitely no Nazis anymore." The Americans respected that. No shots were fired; there were no injuries or casualties.

And what was the beginning of her interest in German-French relationships after an endless history of enmity going back to Julius Caesar, the Franco–Prussian War of 1870–1871, World War I and II?

She was determined to mend German-French relations. It was her deep conviction that you have to reconcile Germans and French first to develop a peaceful and prosperous continent. Seeing that from today's perspective may look easy. But those who have lived through conflicts of similar amplitude, whether in the Middle East, in Africa, or wherever, can understand what an extraordinary achievement it was to have this reconciliation between the two countries. It only worked because on both sides there were people who wanted to make it happen.

On several occasions, my grandmother met Konrad Adenauer [Chancellor of the Federal Republic of Germany from 1949 to 1963] and had an intense correspondence with him. She told him about her initiatives to organize gatherings between German and French, notably by creating partnership programs between towns or even villages from both sides of the Rhine. Adenauer encouraged her. In one of his letters to her he wrote that the political approach can only succeed if it was accompanied by the civil societies.

When I was around 12 years old, French president Valéry Giscard d'Estaing (VGE) was at an event in Hannover. Elsie wanted to tell him something. She pushed through the crowd. The body guards demanded, "Who are you?" She explained, "I'm Elsie Kühn-Leitz from the Federation of German-French Associations; can you give me two minutes." VGE met with her and I took a photograph, just so. I was 12 years old. [Shown at left.]

Did your grandmother get involved in the management of the Leitz Company?

At some point, she did consider this as an option. However, at that time it was a male business, with the succession of Ernst Leitz I, Ernst Leitz II, and then her brothers Ernst Leitz III, Ludwig Leitz, and Günther Leitz.

My grandmother was, after the death of her father, among the shareholders of the company. Actually, since her return to Wetzlar at the end of 1939, she took on the role as a sort of first lady of the family as my great-grandfather lost his wife quite early (and unfortunately later also his second wife).

Haus Friedwart had a huge dining room where 25 people could easily gather around the table. There were always 10 more seats than expected guests. People kept popping in and would be seated. That's how it worked, every evening. So, Elsie had a certain role, but she was not directly involved in the management of the company.

When you were little, did you live in Haus Friedwart?

I was born in Brussels and moved at the age of eight to Hannover. Throughout my childhood, I regularly came to Wetzlar for my holidays. I clearly recall the time, for example, when the whole family came together for Christmas.

Sometimes, even until Christmas eve, my grandmother worked with a small team packing hundreds of little presents and cards for people she knew, including many of the current or former personnel of the family or employees of the company. Even in her later years, she continued to work, often until late, for all the associations and kept a huge correspondence. She was also always there to help people who reached out to her.

She spent a lot of time in Africa. What was the connection?

Elsie had a strong interest in Africa and went there many times. Her friendship with Albert Schweitzer, the Nobel Prize winner from Alsace who ran a hospital to treat tropical diseases in Lambaréné, Gabon, certainly played an important role. She visited him several times and helped as much as she could.

She was also a proponent of independence in the Congo. Several delegations came to Haus Friedwart to negotiate on the constitution. She helped the children of several families who were in danger in the Congo and Nigeria. In many texts and lectures, she

Top: Chancellor Konrad Adenauer and Elsie Kühn-Leitz at the Leitz factory in Wetzlar, 23 October 1958. © Ernst Leitz Foundation.

Above: Patrice Lumumba with Elsie Kühn-Leitz in Haus Friedwart. This photo was taken after the round table discussions in Brussels, May 1960 © Ernst Leitz Foundation.

developed her vision for a sustainable and peaceful development as well as the necessity of developing aid from the West for this continent.

You mentioned that she took many still pictures. Have they been cataloged or digitized?

We have not yet had the time to sort and catalog all her photos that are stored in our archives. There are many shelves with thousands of stills. We need to scan them to digital files. Some of them are surely interesting, both as an illustration of her life and of some historical situations she witnessed.

That's on the long list of actions for the Foundation that are yet to be done. It could be a wonderful idea to host an exhibition to show how Elsie saw the world, which makes me, of course, think of the launch of the ELSIE lens series.

Elsie Kühn-Leitz with Albert Schweitzer in the Cathedral of Wetzlar on 8 October 1959. © Ernst Leitz Foundation.

Endnotes

[i] Mark Honigsbaum, Financial Times, Feb 2, 2007, *New life through a lens*.

[ii] When the Nazis took over in 1933, Ernst Leitz II helped many Jewish employees escape as sales agents for Leica products. He arranged and paid for travel to England, USA, Brazil, and Hong Kong. Furthermore, he gave each a Leica camera that could be sold easily to pay for their expenses. After 1939, the Nazis required the Leitz company to build cameras and binoculars for their war effort. Since many of the factory workers at Leitz and elsewhere in Germany were conscripted as soldiers, the Nazis created one of the largest forced labor systems in history. Many were women from Central and Eastern Europe.

[iii] Frank Dabba Smith's children's book, *Elsie's War*, 2003.

Further reading

Klaus Otto Nass (Oliver's father), *Elsie Kühn-Leitz, Mut zur Menschlichkeit (Courage for Humanity)*, Europa Union Verlag, 1994, a collection of Elsie's letters and documents.

Alfred Ziffer, *Bruno Paul, Haus Friedwart, Wetzlar*, Edition Axel Menges, 2008 (text also in English).

Knut Kühn-Leitz (editor): *Ernst Leitz II: "Ich entscheide hiermit: Es wird riskiert"*, Heel Verlag, 2nd edition, 2014.

Wolfgang Kisselbach on Elsie Kühn-Leitz

Wolfgang Kisselbach, Leica M 240 with PL and Leitz Summicron-C.

Wolfgang Kisselbach is a board member of Ernst Leitz Wetzlar GmbH; Managing Director of Leitz park GmbH; founding Co-Managing Director of ACM, Weller Feinwerktechnik and Viaoptic. His father was Theo Kisselbach, responsible for development and marketing at the Leitz factory, author of The Leica Book, Pocket Leica Book, Leicaflex Book and more. He is one of the best connections about all things Leitz, Leica and Wetzlar. And he is a primary source about Elsie Kühn-Leitz.

Jon Fauer: How did you meet Elsie Kühn-Leitz?

Wolfgang Kisselbach: I was a boy around five or six years old when I first met her. One of my friends was a cousin of Knut, her son. And Knut had one of the most interesting miniature railway systems you can imagine in the attic of Haus Friedwart.

So you got to play with the model trains a lot.

Yes. The house where I grew up is about 500 meters away from there. Most of the Leitz family lived together in Haus Friedwart. It is a very large house. Elsie Kühn-Leitz lived there with her children, Knut and Cornelia, and her brothers Ernest II, Ludwig and Günter.

Günter Leitz and his second wife had a daughter named Beate. She and I were classmates in school for three years. Therefore, I really knew the Leitz family quite well. Ludwig had three daughters and my sister was in school with the youngest. I went on many ski trips to the Austrian ski region Arlberg with the two elder girls of Ludwig Leitz, Yvonne and Ingrid.

I'm still friends with Michael Leitz and meet him quite often. He is the youngest child of Ludwig Leitz. He's really named Ernst Michael Leitz, but the family realized that his uncle Ernst Leitz III was still alive, so they called him Michael. He's quite a nice person. Michael and I were the ones who were able to create and register the name of the Ernst Leitz Wetzlar GmbH (also called Leitz Cine).

So the entire family lived together in Haus Friedwart?

Yes. It was quite a large house and the families all lived there in separate "apartments," or nearby.

And what about Elsie Kühn-Leitz?

For many people in Wetzlar, including my father and me, Elsie was the most powerful person among the four children of Ernst Leitz II. Nowadays, I would say she would have been in the management of the company. But at that time, attitudes were a little bit more conservative. Ernst Leitz III was a fantastic person, and a more or less decent manager. Ludwig was a good designer. He developed guidelines of how Leitz products should be styled as a user-friendly camera. But he was not really a technical person, in my opinion. Günther Leitz helped to create and run ELCAN—Ernst Leitz Canada. For business efficiency, Günther was quite okay, but he was very much involved in a lot of different wives, so that took a lot of time.

But Elsie was really powerful and had a lot of good ideas. She really flourished after the war. Her father had been in the same liberal party and was a good friend of Theodor Heuss, the first President of the Federal Republic of Germany from 1949 to 1959. Because of this connection, Elsie met Konrad Adenauer, our first chancellor. She was an internationalist, which not so many people were at that time. She discussed with Adenauer her ideas to change the history of conflicts between Germany and France, She started, at that time, to create something huge, to change the course of history after the disasters of 1870, the First and Second World War, And she said, "We have to change this for the future." That was really one of her ideas.

Because of all these political connections, she was able to be one of the founders of the Deutsche-Französische Gesellschaft, which was something fantastic. She championed the idea of sister cities. So Wetzlar is connected to Avignon. As a student, I had fantastic possibilities to stay in Avignon for three or four weeks.

She received a medal from France in recognition of her work.

Yes. I can't count all the medals she was awarded. It was very often because she was a person of such altruistic behavior. She spent most of her income on philanthropic things—and this was substantial because she was a shareholder of the company. I think her personal property wasn't so much. She really did a lot for the common good. She did a lot for the town of Wetzlar and for every person she could help.

She was also very much involved in culture. She established concerts for the public. There were three to six concerts every year in Wetzlar. My father attended quite often. When I was old enough, I also went to those concerts as they continued well into the 1970s.

Did her good work reflect well on the company?

Even though Elsie was not directly involved in the company, she was a kind of a foreign minister because she carried the name Kühn-Leitz wherever she went. She was like the social conscience of Leitz. While the rest of the family took care of the business, she added the social and human touch.

If you look at Oskar Barnack, who received most of the credit for the Leica Camera, and Max Berek, who designed the first Leitz lenses, Berek was really, in my opinion, as important as Barnack. His optical designs and lenses were really very good. He's not so well-known. Most people don't know him but he had more or less the same responsibility and importance.

This is the same with Elsie. Most people don't know of her as well as her brothers and her father.

Andreas Kaufmann on ELSIE

Dr. Andreas Kaufmann, Leica Camera AG Supervisory Board Chairman.

Jon Fauer: The backstory of ELSIE is fascinating.

Andreas Kaufmann: I think in all the literature that exists around the Leitz family, Elsie Kuhn-Leitz has been a little bit forgotten. But she had one of the strongest personalities in the family. She was brought up in one of the most famous German progressive schools at the time. There were several: Landschulheim Wickersdorf, Montessori and the Waldorf Rudolf Steiner School.

Where you taught history early in your career. And your interest in history seems to continue as Leitz Cine names products after prominent people from the company's past.

The problem is there are just so many Ernsts in this family of Ernst Leitz. But there are also Ludwig and Günther, brothers of Ernst Leitz III, and many other important people.

Please tell us about the ELSIE lens series.

ELSIE is completely designed, developed and built in Wetzlar Germany. ELSIE is our character influenced and market balanced series in Full Frame, similar to what we did with S35 Summicron-C lenses. The Leitz Primes are the Full Frame (LF/Leica Format) evolution of our Summilux-C—both designed for exceptional performance.

What do you mean by market balanced?

ELSIE is a carefully considered balance of size, weight, optical performance and price.

Do you see more smaller and lighter as a continuing trend?

Yes, cameras are getting smaller and lighter as well—and ELSIE addresses what we see as this ongoing evolution.

How were you able to produce ELSIE at a more affordable price? Making high-end lenses is not exactly a cheap endeavor.

Architecture. Which means certain elements are the same. Easier to source and assemble. Our Leitz Cine Managing Directors, Rainer Hercher and Raimund Bayer, supervised the ELSIE project with a team of mechanical and optical designers who worked together in a very effective way from development to production. If someone in production said, "We're not sure whether this might be efficient to assemble," then the optical and mechanical engineers would work on a redesign that they could assemble easily.

Would you like to comment on the business of the business and how it's going this year?

It is easier to predict in still photography. In cine, it has to do with the working conditions in different countries, vaccination rates and so on. In still photography, our mirrorless Full Frame market is growing. Very few companies produce the so-called consumer still camera anymore. They're still in demand. But the production costs go up. One reason is the smartphone. And the smartphone gets better. We're even working on that at Leica, and recently came out with the Leitz Phone 1. Its camera has a one-inch sensor. The design is aluminum with knurling so you can hold it much better. And then you have a magnetic lens cap with the classic Leica logo. I would say this indicates that it is not just a phone anymore. It's an integrated camera system.

Another reason is that the old cameras and lenses are still pretty good. If you use a DSLR from 2016, it still creates great pictures. This kind of gear has lasted much longer than originally intended. At the moment, there have not been huge steps in quality or amazing technological advances. They have been incremental. This has created a situation where there are few producers left to cover a much smaller market. It creates, let's say, issues. Especially, for sensors and processors. If the production capacity has gone down, either you have to raise prices or exit the market.

Where does that leave Leica for still photography?

We are growing. The key thing at the moment is the supply chain. It is similar to the car industry because certain processors are in high demand. There's not enough production capacity. At the moment, we have to work really hard to secure the supply chain.

When you say the business is growing, is that because your products remain on the high-end?

It's quite simple. We have a different positioning. We do our own distribution and part of our own retail. We are much nearer to the customer. And that creates a different relationship. On the other hand, we are moving more into the pre-owned and classic camera collectors' market. Through auctions and also certified pre-owned [as with Mercedes, BMW and ARRI, for example]. We have customer service and customer care in a number of locations worldwide. Let's say you want to start in a Leica M system. An M 240 still creates great pictures. We will be opening a new store next year in Tokyo, moving the original Ginza store to the Omotesando district. Part of the store will be devoted to pre-owned.

And what of the cine business?

Streaming will grow. I even see this in my own personal behavior. I was one of the last guys to watch TV. This has changed. So, streaming will be the way to go. That means more people will watch more shows. You have to feed this demand. That means more production. In my opinion, we are coming back to the old Hollywood studio system of producing a greater volume of productions at controlled costs. For example, a mini-series in 12 parts, each at 5 to 10 million dollars, costs less than one blockbuster. The classic Hollywood studio system worked in a similarly efficient way. They controlled the entire process. As with streaming, you can own your distribution.

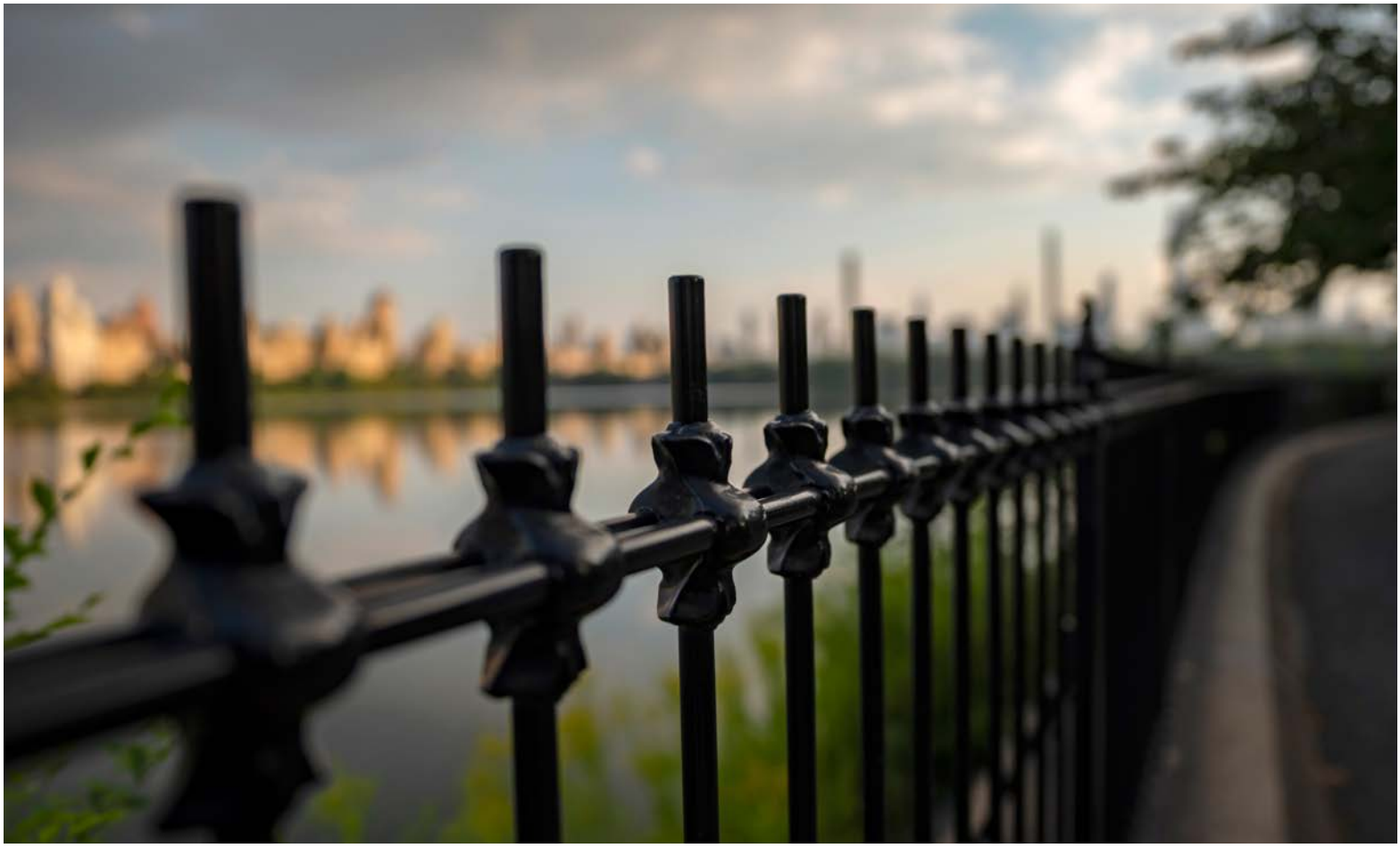
ELSIE with SL2-S

Leica SL-2 with Leitz LPL to L-Mount Adapter.

ELSIE 25mm in the Park with a Leica SL2-S and Leica L to LPL mount adapter.

ELSIE in the Park with SL2-S

ELSIE 25mm T2.1 in Central Park with Leica SL2-S and Jon Fauer.



ELSIE in the Park with SL2-S

Leica SL2-S

Note: Function Button descriptions are default factory settings for Photo Mode.

Note: Function Button descriptions are default factory settings for Photo Mode.

Leica SL2-S Type 9584

- Sensor : CMOS sensor, Full Frame Leica Format (24.6 MP): 6072 x 4056 pixels / APS-C (10.6 MP): 3984 x 2656 pixels.
- Pixel pitch: 5.94 µm
- Stabilization: 5 axis Body Image Stabilization. equivalent of up to 5.5 stops.
- Cover glass: UV/IR filter, no low-pass filter.
- Mount: L-Mount. 20 mm Flange Focal Depth. 51.6 mm I.D.
  Pogo pins for L bayonet lens data communication and metadata.
- Still formats: DNG (RAW data), DNG + JPG, JPG (DCF, Exif 2.31)
- ISO: ISO 50 to ISO 100,000
- Cine formats: MP4: H.264/MPEG-4 AVC with 2ch 48 kHz/16 bit, AAC audio.
  MOV: H.264/MPEG-4 AVC (with 2ch 48 kHz/16 bit, LPCM audio.
- Bit rates: 8 or 10-bit internal recording onto SD card, 10 bit external recording via HDMI.
- Cine color space: Rec. 709 /Rec. 2020 (HLG / L-Log). Cine gamma: Rec. 709, L-Log Rec. 2020, HLG Rec. 2020
- Cine modes: Full Frame - C4K (17:9) 4096 x 2160 (Downsampled from 6000 x 3168)
  Full Frame - 4K (16:9) 3840 x 2160 (Downsampled from 6000 x 3368)
  Full Frame - Full HD (16:9) 1920 x 1080 (Downsampled from 6000 x 3368 pixels)
  Super35 - C4K (17:9) 4096 x 2160 (Downsampled from 4128 x 2176)
  Super35 - UHD 4K (16:9) 3840 x 2160 pixels (Downsampled from 3984 x 2240)
  Super35 - Full HD 1920 x 1080 (Downsampled from 3984 x 2240)
- 10-bit max: MOV C4K, 29.97 fps, 4:2:2 10-bit (internal SD & external HDMI) Full Frame & S35, H.264, ALL-I, 400 Mbps
- Media: Dual internal UHS-II SD slots.
- EVF: 5,760,000 dots, 120 fps, 0.78x mag; 4:3 aspect ratio; 21 mm exit pupil position; +2 to -4 diopters; 0.005 s latency.
- LCD Panel: 3.2" backlit LED with anti-fingerprint and anti-scratch coating, 2,100,000 dots; 3:2 aspect ratio, touch screen.
- Top Display: 1.28" trans-reflective monochrome LCD, 128 x 128 pixels, viewing angle 120°; anti-fingerprint coating.
- Connections: ISO hot shoe with contacts; Full size HDMI 2.0b Type A; USB 3.1 Gen1 Type C; Audio- in & Out 3.5 mm.
- Size / Weight: 146 x 107 x 83 mm / approx. 850 g (without battery), approx. 931 g (with battery).

SL2-S as Director's Finder with ELSIE

1. This is how the main display looks when you turn the camera on. 2. To reset to factory settings, push the MENU button repeatedly) until you see "RESET CAMERA" on the last page. The 4-direction joystick is the easiest way to navigate within menu pages. Push in to select.

3. Push the MENU button once. You probably will see this screen, PHOTO mode. It has a black background.

4. Jump from PHOTO to VIDEO mode by touching the TFT display. Or navigate with the joystick. VIDEO mode has a white background.

5. By default, the top button closest to the top display is mapped to toggle between PHOTO-VIDEO modes. Note that shutter angle is shown.

You can toggle the RECORDING MODE from VIDEO to CINE. In CINE, settings are shown in shutter angle and EI ASA. In VIDEO, settings are shown as shutter speed and ISO.

6. Today, you're working with SL2-S as a DP/Directors Finder and so we want PHOTO Mode. Shutter speed is shown along with ISO.

The SL2-S has many ways of doing things. Menus and functions are as customizable as a BMW. Some suggestions follow on the next page.

SL2-S as Director's Finder with ELSIE

Front Thumbwheel to set Shutter Speed.

7. Because ELSIE is a manual aperture cine lens, you want easy access to shutter speed for exposure control.

By default, the SL2-S lets you adjust shutter speed with the front thumbwheel.

If nothing happens when you rotate the thumbwheel, go to page 4 of the Menu and turn off DIAL LOCK and JOYSTICK LOCK.

Push joystick to Enlarge and then: Jump between 3 Focus Enlargement Settings by rotating either the front or the rear thumbwheel.

Joystick

8. ELSIE is, of course, a manual focus cine lens. And so you want a quick way to enlarge the image for accurate focus settings.

By default, you can press the joystick to select an area of interest and enlarge the image. You can also press the top function button on the front of the SL2-S.

There are 3 Image Enlargement settings. They are selected by rotating either the front or the rear thumbwheel. False color is also available if you want it.

Overall scene

Enlarged for focus

ARRI ALEXA Mini LF with native LPL Mount

RED RANGER MONSTRO 8K with Wooden Camera LPL Mount

Sony FX6 with Vocas LPL to E-mount adapter

Sony VENICE with Kippertie LPL Mount

Leitz Cine made a bold statement with their introduction of ELSIE prime lenses in LPL-only mounts, no PL.

When ARRI launched the LPL mount for ALEXA LF and Signature Primes in 2018, there seemed to be a collective curiosity: "Would LPL take off in a PL world?"

ARRI subsequently put LPL lens mounts on ALEXA LF, ALEXA Classic/XT/SXT, ALEXA Mini LF, ALEXA Mini, AMIRA, and ALEXA 65 cameras. LPL-to-PL adapters offered backwards compatibility with all PL mount lenses.

LPL has a Flange Focal Depth of 44mm and I.D. of 62mm.
PL has a Flange Focal Depth of 54mm and I.D. of 54mm.

Word got out that ARRI was sharing LPL specifications, in their words, "to establish the LPL lens mount as the new standard interface between cameras and lenses."

Accessory makers were quick to program their CNC machines and provide LPL-to-PL adapters and LPL-to-almost-any-camera-you-could-name adapters. These companies include Kippertie, Wooden Camera, Kipon, Fotodiox, Vocas, c7, Leitz and ARRI.

Lens manufacturers seemed to take a little longer, but by now, you can order LPL mounts as an alternative to PL from Angénieux, Atlas, Cooke, Leitz, Tokina, SIGMA, ZEISS, and more.

You can get LPL lens mounts for Director/DP viewfinders, extenders, expanders, close-focus adapters, lens projectors, and depth testing tools.

But waiting to see which manufacturer other than ARRI would make LPL-only lenses and cameras was a waiting game. Leitz made the move with ELSIE.

Industry standards in the cine industry do not change quickly or without good reasons. It took 29 years to budge from the tab-grab aluminum ARRI Standard mount, introduced in 1936, to the twist-to-lock stainless steel ARRI bayonet in 1965. The ARRI PL (Positive Lock) mount arrived 17 years later with the 35BL-3 in 1982. Its locating pin aligned the lens, it didn't twist, and the breech lock grabbed it tight. (Incidentally, the Mitchell BNC mount was also a breech lock, introduced in 1932.)

And then, 36 years after the first PL mount, ARRI brought out the LPL mount with the launch of ALEXA LF and Signature Primes in 2018. Why?

Thorsten Meywald, ARRI Product Manager for Optical Systems, and Signature Primes and Zooms, explained at the time, "Sensor size determines lens barrel diameter and the exit pupil size. The 'sweet spot' is generally in the range of having the flange focal distance around the same as the sensor diagonal. The ALEXA LF (and Mini LF) sensor has a 44.71 mm diagonal. The flange focal distance is 44 mm.

"In the early design phase, we put aside thoughts about PL, XPL or any existing kind of mount and asked instead what would be the ideal mount or the ideal dimension for this camera and lens system. After a while, the optical and mechanical lens designers came back and that's how we ended up with 44 mm flange focal depth and a 62 mm diameter.

"There was an added mechanical reason for the 44 mm depth. That was the minimum distance to retrofit the new LPL mount onto all existing ALEXA, ALEXA Mini and AMIRA cameras (except the ALEXA Studio with its spinning mirror shutter). We have a legacy of tens of thousands of PL cameras and lenses out in the market and need to make sure that nothing becomes obsolete.

"There seems to be a consensus among other Full Frame designers about flange focal depth for Full Frame sensors. The Canon EF mount is also 44 mm, Nikon F is 46.5 mm and Panavision DXL SP70 mount is 40 mm.

"Clearly, 44 mm is a 'happy distance.' Although the PL mount has been a standard for many years, at some point we needed to rethink everything and ask if we really must stick to the old system and compromise in the future? For us, it really was time to acknowledge that the PL mount was made for the much smaller format of Super35. Yes, you can get the light through to a Full Frame sensor with a PL mount, but not in an ideal way, especially when it comes to high speed or high performance lenses.

"We are inviting other lens and camera manufacturers to participate in our new LPL mount technology to form a common standard in our industry."

Who's next?

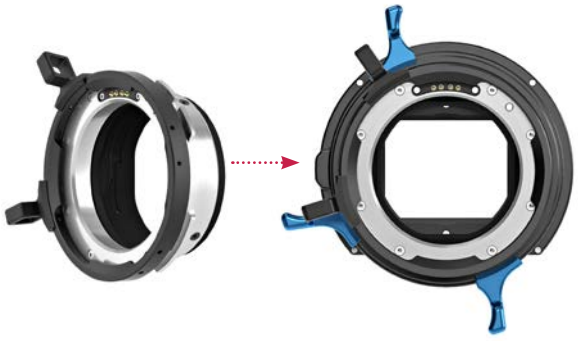
Wooden Camera's LPL Mount for Sony VENICE has connectors that send /i lens metadata directly to the camera via pogo pins.

For a RED DSMC2 MONSTRO 8K VV, attach the Wooden Camera LPL mount with 4 captive screws. The Wooden Camera LPL mount has LDS-2 pogo contacts that connect to a 00 Lemo connector on the outside.

DENZ FDC-LPL Multi Tool Focal Depth Controller

Vocas E-mount-to-LPL adapter, exploded view

Vocas LPL to LPL 20mm Close-Up Adapter



ARRI LPL-to-PL Adapter

- LDS-1 and LDS-2 PL contacts are at the 12 o'clock position.
- What happens if you're using an /i lens? Aren't the contacts supposed to be at the 3 o'clock position? Yes. In that case, just rotate the LPL-to-PL adapter 90 degrees clockwise and lock in place.
- With the LPL-to-PL adapter in place, it's easy to see which mount is which. The PL mount has 2 traditional black ears. The LPL mount has 3 blue ears.

Wooden Camera E-to-LPL adapter for Sony E-Mount Cameras, such as the Sony Alpha series a1, a7, a9, FS7, FS5, FX3, FX6, FX9. LPL Mount is passive and does not communicate lens data to the camera.

Business of the Business: Tim Pugh, CEO of Cooke Optics

Tim Pugh, CEO of Cooke Optics

Tim Pugh joined Cooke Optics in October 2020 as CEO. The following "Business of the Business" conversation was conducted by transatlantic cable, "prisoners of Zoom" as Tim calls it. Our webcam video surely was not the glorious Cooke look one would have expected. Consider this discussion to be somewhat like the Financial Times' "Lunch with the FT," unfortunately without the lunch.

Jon Fauer: Shall we begin at the beginning before you joined Cooke Optics?

Tim Pugh: I'm British. I was brought up in the West Country of the UK; I went to university in the Midlands. My career started in the automotive business and evolved into supply chain and support roles. Before coming to Cooke, I was the CEO of a UK-based technology and manufacturing business called James Briggs Ltd (JBL). It has a long heritage in manufacturing; it's been in business even longer than Cooke so I understand the importance of history.

JBL has a nice catchline, "It's all about the chemistry."

JBL manufactures very technical, specialist products, for example automotive paints and coatings. These involve precision manufacturing with an international network of retailers and distributors. I think there are a lot of similarities with Cooke. I guess I was able to persuade Les Zellan that there were sufficient parallels.

When we first met, you mentioned that JBL is a major supplier of WD-40, a product that many of us use on film equipment. We have used WD-40 to protect the exterior surfaces of cameras and lenses (the barrels, not the optical elements) in locations with salt water spray. WD-40 also can be good for removing gaffer tape and sticky shipping labels from equipment cases.

There's a wonderful website, I think it's called 1001 uses for WD-40. You see remarkable examples based upon its hydrophobic properties. JBL is a really good example of being the custodian of a brand. You are responsible for the way the WD-40 product performs, the way its users see its performance and use it.

Again, that is another parallel with Cooke. We were making something that was intrinsically linked to customers around the world. Everybody knows WD-40. And everybody in the cinema industry knows Cooke.

Please tell us about this past year, how you responded, what you've been doing?

I joined Cooke at the end of October 2020. Les Zellan had done an absolutely fantastic job building the business, getting it to where it is, and to its position as a leading brand in the marketplace. Les was looking toward retirement as was Robert Howard. They were looking to pass the baton, I suppose, for someone to take it forward to the next stage. It's a real privilege and opportunity being part of Cooke. As we've touched upon, I think that Cooke has a genuinely privileged relationship with its customers. That has opened doors to where the business is now and sets the path to where we take it forward.

Inevitably, a lot of my early time was spent listening, talking, asking questions, understanding. I've had many discussions with customers all around the world through the "prison of Zoom." As with many people, my specialist subject lately would be Zoom and Teams calls.

In the context of what's gone on with COVID and all the challenges, actually our business has performed very well. If you take a step back, we have a business with a fantastic platform, a great position in the market, with very strong relationships, but we also need to be looking forward to how we move ahead. As in so many businesses, the pandemic has accelerated that review. The business has a fantastic heritage, but the way I tend to describe it, Cooke is actually a really modern business with a great heritage. That's driving a lot of the thinking of what we do.

The focus of our plans and activities essentially sits in four areas. I'll try and present these logically and then talk through them.

- First is building capacity and even greater manufacturing excellence.
- Second is a strong NPD (New Product Development) pipeline that creates excitement about the future .
- The third strand is all about representation and what I call our partner strategy, how we work with our customers.
- The fourth is about reinforcing the brand and extending our marketing.

I would stress these are all evolutions of what's gone before. I'm very proud to have this job and I feel a great sense of responsibility to make sure that Cooke carries on in the right direction. This is all about building on the past, not stepping away from it.

Excellent. I heard that you expanded the factory.

Yes, we are in the process of developing a second manufacturing site here in Leicester, not too far away from the current site. Broadly speaking, we are a business that historically has been very fortunate to have been constrained more by capacity than by demand. We are looking to address that. The second factory will give us a substantial uplift in manufacturing capacity going forward. It is still founded on the same hand-crafted assembly principles of Cooke and that absolutely is what the product is still about.

We're very fortunate that our board members, including those from our investors Caledonia Private Capital, are tremendously supportive. They've invested in the business to create this capacity going forward, including the latest clean room technology and all the aspects you would expect to support a modern assembly operation. As a growing business, we're also recruiting more people. So, capacity is the first piece.

That clearly connects to the second element: new product development and the whole NPD pipeline. This is a business founded on the quality of the lenses we produce. They are very technical products that are hand-crafted. The brain power and the thinking that goes into the design is tremendous. And when Cooke lenses deliver fabulous images that are about telling stories on screen, there's a wonderful connection between the two.

We have a very strong vision and a plan for how our product line-up will evolve over the next two to five years. A lot of that was already in play, but we're firming that up and implementing the plans. There are some products coming down the track that I really think will make people sit up and take notice, though it's just too early to talk about them yet. So, we have to conceive what those products have to be, and we have to be able to make them—hence investment in manufacturing. Those two are interconnected.

The third aspect is to do with representation and what I call our partner strategy. This is a good example of how we've looked at very different businesses that operate through similar sorts of structures. We've spent a lot of time trying to get under the covers, as it were, of really understanding what makes Cooke tick and the way that people see Cooke, both the good and the areas for improvement. Clearly there are huge levels of personal relationships in the business, a lot them based upon those close contacts. Les Zellan was a master at this in terms of being accessible to everyone.

I'm delighted to say that's very much carried on in the business. Thomas Greiser, whom you know, is our global sales director. He's been in the industry many years. Everybody knows Carey Duffy, Eric Johnston, Hon Ming Lai, Christine Brnic and the rest of our sales team, and Kees van Oostrum as well. And I will happily talk to anybody.

We're trying to maintain those personal relationships, but also recognize that, as the world evolves, we at Cooke need to invest more in the ways that we support some of our resellers and rental companies around their marketing and sales activities. We're looking at how we can put in place more of a structure to support people.

We want to engage in the right levels, as you would expect of a premium player such as Cooke, in how users, rental houses, resellers and repair companies are able to sell, service and support Cooke out in the marketplace. We will also be presenting these plans to the market shortly.

I should also say that we're investing in our own business at the moment with a couple of new facilities. We have significant business in China that is growing and we already have a service and support operation in Shanghai. We are now working on launching a service and support center in Beijing as well to support our distributor and customers there.

In the US, we continue to have our operations based in New Jersey. We will be opening an additional facility on the West Coast as a service and support hub for what is a clearly critical market. They are designed to work in conjunction with resellers and rental houses. Again, that's making sure we've got the right representation in the right parts of the world.

The fourth area is our brand and marketing activity. It's one of the fabulous things about Cooke. Just look at the show reel of films and productions created with Cooke Optics. We have a new digital marketing agency to support us. We will be launching a new website that, I think, reflects the brand in a very appropriate way. It will be quite a change in how people see the business. We're also looking at how we make sure that we maximize the brand and marketing presence of the business in all the things we do at shows and with product launches.

So that summarizes the four areas that define where we are going and the core of what we've been doing. We haven't been idle.

You certainly have a lot going on. And, it seems that productions are also very busy now.

Yes. During COVID, we have seen different rates of production as the pandemic has flowed across the world.

There was a period of time when the Chinese market was starting to open up again and we saw a real uplift in productions in China after Chinese New Year. The US was obviously slower to re-open, but they've really started to move strongly. Europe is very much like the US at the moment. With the current level of uncertainty about COVID, we might see the peaks and troughs, but they've all started to move in a very encouraging way at the moment, which is good. We feel we are in a good place. We still have a very strong flow of orders.

Motion picture production is extremely busy now. Some crews are booked for the next three years; studios seem to be booked for the next 10 years. One of driving forces is streaming. Some people have called it an industrialization of our business.

It is, to a degree, driven by streaming, but not entirely. The convergence and integration of technology within the film business is also responsible, whether it's shooting, VFX or post-production.

Our /i Technology is seeing a growing interest and appreciation for how it can connect into the wider infrastructure that's starting to develop. There are a lot of very fast-moving, smart start-ups, small businesses that are really driving the change. The power of streaming is also facilitating a huge amount of interesting development, technological gains and some quite entrepreneurial businesses that are flowing through as a result.

Panorama of the Clean Room at Cooke Optics in Leicester, UK.

Some people have said that streaming is democratizing the business even more than before. Maybe in good ways, but possibly detrimental ways. The worry is that democratization will drive the cost of goods and services down as it has in computers or consumer electronics. Without getting into specifics of your products, do you agree? We see, for example, that Sony's VENICE camera is a top-of-the-line flagship, but they are also manufacturing massive quantities of $6000 to $9000 cine cameras.

I see this kind of democratization as a positive thing while acknowledging the dynamics of the changing economics on some businesses. From a Cooke point of view, we continue to be a premium brand player. For us, what's super important is that we continue to develop our new products with the technology, performance and reliability that maintain the right price point and value positioning— and therefore the serviceability, reliability and durability that the rental houses and users expect from having our product on their shelves to rent or use.

I suspect that the driving down of cost will not be consistent across all sectors. There will be those who are able to maintain their position because of what they do, and that is a lot of what I'm talking about in relation to Cooke.

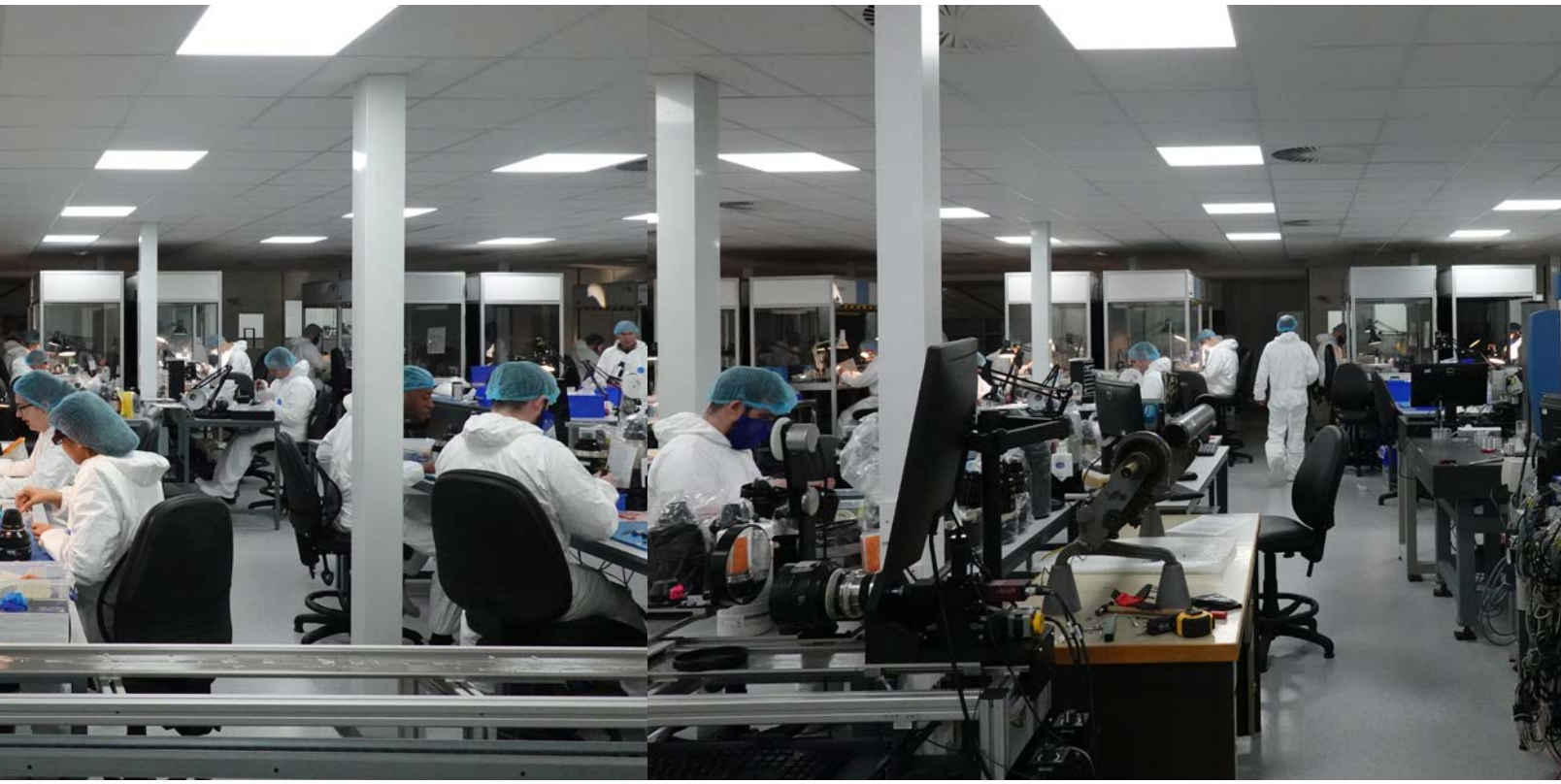
We sit where we sit in the marketplace and we want to be absolutely clear that when our products are being used by rental houses and cinematographers, they know what they're getting. They get the value, they can then appropriately provide the right level of service to their customers and to the production. There will be others who probably find that a more challenging proposition. I think the market will segment accordingly.

You can see that in the car market as an example, I would suggest. At the lower end, it absolutely is quite a price fight, but when you get into products that are bringing something new or different, whether electric or other new technology development, there are clear pricing propositions that still drive the demand.

Your analogy of the car business is very appropriate. It seems there is and always will be a luxury car market. But are there any luxury car makers, comparable to Cooke, who really don't do entry level products?

Maybe it's my own background, but I often do draw the car comparison. As an example, Aston Martin are a powerful premium brand. A business with a fantastic heritage and reputation, but one that is also building for the future via electric and other technological developments that evoke a new way of looking at the brand. That would very much be a Cooke type comparator. I think if you can maintain that prestige, and the prestige is supported by quality, reliability and durability, then you've got the opportunity to maintain your valued position.

When you try to forecast larger market trends, it's hard to tell, isn't it? We conduct a large amount of market research to understand trends, and the range of issues impacting the world of cinematography. Even so, we may still sit here in 12 months and say, "Oh my word, we didn't quite see that one coming." But, actually, that's also quite exciting. One of the many things that I love about Cooke is that we are of a size and a scale where people can be very confident dealing with us, yet we still have the level of flexibility and agility to respond. We are supported by a board and investors who challenge us to think about what that future world might look like, and how Cooke will best play its part.



Is /i Technology part of your future product planning?

I've alluded to some things that are under development but yet to go public, but you probably get my sense. You will see some highly interesting developments with /i Technology, supporting film makers further increase efficiency and drive down cost.

Cooke is still of a size where we can be flexible to adapt and work in a slightly smarter way. I've worked in those sorts of large corporations where we were not able to move quite so quickly. They have plenty of strengths that come with scale, but as the market evolves and changes, I absolutely believe that Cooke can hop on to some of these trends and continue to work with creative people within metadata and post-production, which is what we're doing at the moment.

You mentioned a new digital marketing agency. Do you want to talk a little more about that?

I think our strategy is reflective of where our audience is now. We all use phones and tablets and laptops, so it's simply enabling people to engage with Cooke in the right fashion.

We always want to have that personal relationship with people and shortly it will become an awful lot easier. If you want to find technical information, you want to find warranty information, you want to find specification detail about your lens, or you want to know where you can go and buy or rent a lens, it will become a lot easier via our website and digital channels. This business has made it harder, historically perhaps, to find some of the information that our customers are now expecting.

To deliver a higher quality of service, digital marketing doesn't replace the fact that you can pick the phone up and talk to someone you know, but it actually means, if you're trying to check specifications, such as distortion mapping, you can just go very simply to the Cooke website.

We are also a business that always has had a social responsibility. One of the lovely things of being at Cooke is that it's an aspirational brand and we want to make sure that young up-and-coming cinematographers and students feel that we are attainable and accessible and approachable. We're looking at how we can do more to communicate and engage and support that marketplace as well. Kees is very strong on this; you probably know he lectures and has a great role as a professor in China. I think we can do more to engage with that part of the market so that, as and when they progress, we support them through their career. As and when they reach a point where they're in the market for Cooke, they've got that affinity and relationship.

Aspirational is a very appropriate word and very resonant with how people see Cooke. The Cooke Look is also aspirational.

The business has always been good at getting the balance between being aspirational but also achievable. Some companies can be aspirational but metaphorically there's still a barrier between the brand and prospective customer that's hard to break down. That can never be the Cooke way. We want people to feel that being part of the Cooke family is something achievable and attainable.

And so, in summary?

Cooke is a fantastic brand with great products, and I'm pleased to say that business is good. As we evolve in exciting ways, how we engage with our customers will also evolve. As our manufacturing capacity grows and new products are launched, we believe we can widen people's accessibility to our products, both lenses and /i Technology. It's that balance: a prestige brand that's accessible and approachable, and an exciting, modern business building on its great heritage.

Actual size:
4.25"w x 4.25" h
x 6" long

Note: this is the limited edition in white. Serial production models will follow.

Leaping' lizards!

Following on the path of Super35 KOMODO, another reptilian-named RED camera came in.

RED announced V-RAPTOR, as in Velociraptor.

V-RAPTOR is an 8K Full Frame (VV) or 6K Super35 or 3K Super16 cine camera. It weighs a mere 4.03 lb.

V-RAPTOR has a new DSMC3 body that is just slightly larger than KOMODO—it's about 4.25" w x 4.25"h x 6" long.

There is an RF mount on the front with a double lock unique to RED. Not only does the lens lock into place with the standard bayonet but a secondary breech lock cinches the lens into place providing bountiful support for heavier lenses, thus assuring the glass is kept parallel to the sensor plane.

The mount is clearly labeled with text and arrows—LOCK and UNLOCK—just so. Mercifully, V-RAPTOR's breech lock clocks to lock—in other words, it follows tradition and standards of cinematic decades by locking in a clockwise direction, as do PL, LPL, Panavision PV, Panavision SP70, Mitchell BNCR, and other mounts.

(KOMODO also has an RF mount, but no lever lock. Like Canon R series still cameras, you insert and twist the lens clockwise in the RF mount to lock it in place.)

Sony E-mount, Canon EF mount, and Leica/SIGMA/Panasonic L Mount alliance lenses also lock in place by twisting the lens clockwise. Counter-intuitively, counter-clockwise rotation is how the Sony VENICE and FX9 lever-locks grab E-mount lenses. Continuing this tirade on direction, I might add that Nikon F-mount lenses also twist counter-clockwise to lock. But I digress.

Meanwhile, back at V-RAPTOR, its Canon-style RF mount has a flange focal depth (lens mount to sensor) of 20mm. The inside diameter of the mount is 54mm. So, this means you can use almost any lens on the planet with RF lens mount adapters.

If you are a maker of mount adapters, you are surely reveling in the plethora of ¼-20 mounting threads up front. You can almost hear those threads calling out to be employed for extra stability on mount adapters carrying big and heavy LPL and PL lenses.

The DSMC3 RED Touch 7.0" LCD Monitor has a 1920 x 1200 display. It maxes out at 1300 nits peak brightness. You have full touchscreen control to adjust camera settings. Because I believe the monitor is made in collaboration with SmallHD, the menu system has a familiar SmallHD PageOS UI. The monitor tilts and rotates. It attaches to the top of the camera and connects directly with pogo pins for power and video without cables. You can also tether the monitor and attach it elsewhere by connecting a single, locking USB-C style DSMC3 RMI cable that carries power and video. No additional cables are needed.

The sensor is a new design. With 8K, 8192 x 4320 resolution (about 35.4 Megapixels), the sensor measures 40.96mm x 21.60mm. It's capable of delivering 120 fps with a read reset time half that of the previous MONSTRO sensor.

RED V-RAPTOR

Some Specs

- Record to CFexpress 2.0 Type B media.
- Record in REDCODE RAW (R3D) HQ, MQ and LQ
- Anamorphic Desqueeze. For example: 2x, 1.8x, 1.6x, 1.5x, 1.3x, 1.25x desqueeze in 8K (Full Frame) and 6K (Super35).
- 2.4" LCD menu display on camera right side.
- Dual BNC SDI outputs: 12G-SDI with 6G-SDI, 3G-SDI and 1.5G-SDI.
- HANC Metadata (horizontal ancillary data) recorded.
- RED Control / Fool Control.
- Wired control via USB-C or Gigabit Ethernet (compatible USB-C to Ethernet adapter required) for remote camera control, live MJPEG preview video feed and remote media offload.
- Wi-Fi for camera control and wireless video monitoring via a swappable dual band (2.4 GHz/5 GHz) antenna mounted to a female RP-SMA connector.
- 1080p video preview via 2.4Ghz/5Ghz Wi-Fi.
- Genlock, SMPTE Timecode-in, GPIO and Ctrl (RS-232) via the a 9-pin EXT port at the rear of the camera.
- Built-in micro V-Mount Battery plate on the rear of the camera.

Actual size comparisons: FF/VV V-RAPTOR above. S35 KOMODO below

Maximum Framerates:

(these are just a few of the many choices)

- 120 fps in 8K 17:9 (8192 x 4320).
- 150 fps in 8K 2.4:1 (8192 x 3456).
- 160 fps in 6K 17:9 (6144 x 3240).
- 200 fps in 6K 2.4:1 (6144 x 2592).
- 240 fps in 4K 17:9 (4096 x 2160).
- 600 fps in 2K 2.4:1 (2048 x 864).

Sensor Modes (R3D)

- 8K 8K 17:9 (8192 x 4320), 2:1, 2.4:1, 16:9, 1:1 & Anamorphic 2x, 1.8x, 1.6x, 1.5x, 1.3x, 1.25x.
- 7K 17:9 (7168 x 3780), 2:1, 2.4:1, 16:9, 1:1 & Anamorphic 2x, 1.8x, 1.6x.
- 6K 17:9 (6144 x 3240), 2:1, 2.4:1, 16:9, 1:1 & Anamorphic 1.5x, 1.3x, 1.25x.
- 5K 17:9 (5120 x 2700), 2:1, 2.4:1, 16:9, 1:1.
- 4K 17:9 (4096 x 2160), 2:1, 2.4:1, 16:9, 1:1.
- 3K 17:9 (3072 x 1620), 2:1, 2.4:1, 16:9, 1:1.
- 2K 17:9 (2048 x 1080), 2:1, 2.4:1, 16:9, 1:1.

ww.red.com

RED V-RAPTOR


1/4-20
V-RAPTOR
1/4-20
RED
REC
1/4
1/4


RED DIGITAL CINEMA
V-RAPTOR
RED


SDI-1
SDI-2
DC-IN
REC
RED
MENU
LOCK
SEL
1/4-20


RED
EJECT
PUSH
ACCESS
MEDIA
1/4-20
8K-VV


RED DIGITAL CINEMA
V-RAPTOR
RED
1/4-20


RED DIGITAL CINEMA
RED
1/4-20


RED DIGITAL CINEMA
RED
EJECT
1/4-20
8K-VV
RED


8K-VV
RED
SDI-1
SDI-2
AUDIO
11-17V
EXT

Rob McLachlan, ASC, CSC, Supreme, Radiance, VENICE, Chicago...

Rob McLachlan, ASC, CSC reports, "Almost done here on *Shining Girls*. Our terrific 2nd AC snapped some photos of me holding ZEISS Supreme and Supreme Radiance Primes with a Radiance Prime mounted on my Sony A7III — in the incredible old movie palace Chicago's Uptown Theater.

"It's a new Apple series based on the book *Shining Girls* starring Elizabeth Moss set in 1992 Chicago.

"The camera is VENICE which continues to amaze me. The lenses are ZEISS Supremes and ZEISS Radiance."

Bertram van Munster on *Race to the Center of the Earth*

Bertram van Munster is an Executive Producer of National Geographic's adventure competition series "Race to the Center of the Earth" which was shot with 16 URSA Mini Pro 4.6K G2 cameras. He is the co-creator and producer of The Amazing Race, running since its inception in 2001.

Jon Fauer: Can you please tell us about your show, "Race to the Center of the Earth?"

Bertram van Munster: *Race to the Center of the Earth* is a global adventure competition with contestants who are not professional mountain climbers and explorers. But they're very enthusiastic. You might call them adventure weekend warriors. They are serious about it. They can do specific things, but they always have to go to the limits of their abilities and the edge of fear so they can perform. It's exciting and relatable to an audience. If we had only perfect athletes who know how to do everything, it would be difficult to relate.

The contestants race from four different points on the globe along designated routes through a variety of challenging terrains. On the last leg, the four teams meet in Hawaii and race to a buoy in the middle of the ocean. That's the center of the earth. The winning team splits a million-dollar prize. One team of three people starts at the border of China and North Vietnam. Another team of three starts at the most southern tip of South America, just one island away from Antarctica and make their way north through Chile and Argentina. Another team starts in Siberia. And the fourth team starts from the east coast of Canada and go all the way to the west coast, which is also a harrowing trip.

They all start at the same time from their different positions. The teams do not have communication except for a device that steers them from across the landscape. But that's all they get as a roadmap. They get the instructions on this device and they have to make their way. And it all takes place in totally remote areas.

Does each team travel the same total distance?

Yes. They're all exactly the same. They have different obstacles, but at the end of the day, their obstacles are very similar. So if one team has to climb a mountain in South America, another has to do the same thing in Siberia.

When we started in South America, we expected good weather and ended up in a tremendous snow storm. That unpredictability is what we like in these types of shows. I love it when, instead of beautiful weather, it turns out to be a blizzard. It gives us better drama. The world climate has changed quite a bit all over. Siberia happened to be very warm. And in southeast Asia, we had a tremendous amount of rain.

And how do you select the camera crews?

I personally select the camera crews. First of all, they have to be very good cinematographers, and not just anybody. They have to be willing to do something like this. They have to perform the same task basically as the contestants do, except they also have to carry 50 pounds of camera gear and accessories. We have a pretty substantial support team that travels with them. We have about 30 people per team observing and working with multiple cameras. Of course, they have to be in good physical condition. They have to love what they do and have to be excellent at their craft. If you want to work with me, you have to be really good.

It sounds tougher to be on your crew than to be a contestant.

In a weird way, it might be, yes. They also have to sleep in the middle of nowhere. There are no hotels. Where we go, nothing is there. We are literally hundreds and hundreds of miles from what you call civilization. The crew sleeps wherever they can.

I understand you used 17 Blackmagic URSA Mini Pro 4.6K G2 cameras. How do you choose the cameras?

First of all, we base the camera on the picture and audio quality that the camera has to deliver. That's number one. Number two, we pick it based on the industrial design. Is it a camera that we can use under these kinds of conditions? Can we go and take it through snow and ice and sleet and rain, like the post office letter carrier? Does it hold up? Is the design practical enough? And is it sturdy enough to go where we go? Work in all climates. They go through hell, these cameras. There's no question about it. And they have to keep working. As I said, the main thing we aim for is the best picture quality we can come up with.

Do you own the equipment or do you rent it?

We own our own equipment mostly. We bought all these cameras brand new and we bought a lot of them.

Do you have an equipment manager to take care of logistics?

Yes. We have an excellent staff of logistical people who travel with us. Every team has its own equipment manager. And they all had to know this equipment really well.

Photos courtesy of Bertram van Munster.

When the show is done, what happens with the cameras?

We sell them. And then for the next production, we buy the latest iteration of what's out there. These types of productions are very expensive. So I always owe it to the wonderful people who sponsor these kinds of shows that they get the best of the best. I don't rent the equipment. We buy it. We shoot the show with it, make it as good as we can, and sell it. And for the next show, we buy new equipment.

That's a smart business model. Did you always do it that way, even in the analog 16mm days?

Yes, I always owned my own equipment as a cinematographer.

I think you had Eclair ACL cameras?

We had the ACL, CP16, 16SR. I'm a big fan of Arriflex. My career started at ARRI. That's where I worked. At Türkenstraße 89. I knew both Arnold and Richter. I was an apprentice in the film lab. When I go to Munich, which is at least once a year, I like to go by there. It's changed a lot.

What about lenses for Race to the Center of the Earth?"

People love to use prime lenses all the time, but they're very unpractical for the type of shows that we do under these kinds of conditions. Certainly we have a whole set of prime lenses, but changing lenses in a snow storm while hanging off a mountain is not practical. I personally like to use the shorter zoom lenses. The longer ones don't do you any good for handheld. The shows that we do are personal and up-close, so you need a wider angle lens to be with them at all times. If they walk a bit away from you, you need to be able to still reach on a zoom lens. I've always like the Angénieux zooms. And Cooke primes. They were very effective.

Do you go on location to all these crazy places?

Yes. I direct the shows. I go to all locations. And if I cannot go, I give them very specific instructions on paper because I know these locations very well, where to place cameras, how to do it, what background, et cetera. And then I turn them loose. Most of the guys know me very well. They know exactly what I'm looking for: "Do not copy other shows. Do it my way, please. If you want to do it your way, do your own show."

Well, you're a stubborn Dutchman, right?

Stubborn Dutch guy, yes. Well, filmmaking is very personal. That's how I grew up with it. But also, people like when you show commitment, enthusiasm, creativity. I'm not just there as an executive producer to take a check. That's not who I am. I want to be involved. I want to know exactly what's going on, and I want to be supportive of everything.

We have incredible people working with us who really want to do this. These are not the shows you do just for a paycheck. These guys are adventure lovers. They want to do it. They want to go to the extreme. They're extraordinary: the cinematographers, the sound recordists, the producers, the field producers, the fixers. Everybody wants to go to the bitter end. But they also know me. And if you don't go to the bitter end, I'm going to pay you a visit. You always have to remember you're working with other people's money.

Josh Gitersonke on *Race to the Center of the Earth*

Josh Gitersonke during camera prep. Quite a lot of equipment.

Joshua Gitersonke was the main Director of Photography on National Geographic's "Race to the Center of the Earth."

Jon Fauer: Can you give us some background on *Race to the Center of the Earth* and how you wound up shooting it?

Josh Gitersonke: I've worked on *Amazing Race* for about 10 years. I started out as a camera operator. It's a crazy butt kicker of a show. You're running 10 miles a day with a 25-pound camera, up mountains, down mountains, up a bunch of stairs, down stairs. This season there's a 450 stair incline. So, long story short, I became the DP on *Amazing Race* about three years ago.

So you're the main DP and there are many camera operators.

Yes. So, I'm the leader of the crazy gang of people who run around the world. And by people, I mean great camera operators who are all DPs in their own right. I wouldn't say we are adrenaline junkies but we are very happy to put in a hard day's run and try to shoot things that look beautiful along the way. The similarities of *Amazing Race* and *Race to the Center of the Earth* are that you're really running and making an effort. These are real races. We're not trying to stop the contestants to get a different angle. If the contestants go to the bathroom, I usually try to go to the bathroom because I'm not going to stop them because I need to do that. It's a real race for real money so we try not to be a limitation in their game.

For example, in *Race to the Center of the Earth* there are beautiful scenery shots that seem carefully set up and then the contestants cross the frame in just the right spot. How did you get there ahead of them?

Well, with *Race to the Center of the Earth,* we were lucky that production agreed to have three camera operators per team. So, it wasn't just one of us trying to do this by ourselves. That enabled us to get ahead of our contestants and get set up. One person would hopscotch in a car or on a bicycle or by hiking. A lot of the stuff is happening in mountainous terrain. So, I'm going to get up a half mile ahead and then you're going to peel off a half mile to the right. And then we're going to meet up and I'm going to go further than you. And we're just going to hopscotch and keep moving.

Where we were doing this hopscotching, the drone would take off and do its thing. Basically it was a lot of getting close to them, staying with them for a little while, seeing that we were going to have a really great opportunity for a beautiful vista, and then peeling off and running off to a different part of the mountain or a different part of the valley or something like that. And getting far enough away that the other camera operator can get a really great shot.

How did you know that they would actually cross exactly where you wanted them to? Experience?

On *Race to the Center*, they did have some GPS coordinates that they're trying to follow. Obviously they didn't always follow those coordinates, which can be seen in the show. So, we do our best to cover that. I scouted a bunch of the locations and would find cool vantage points. We put those in a GPS map and had ideal spots for great shots.

But it doesn't always work out like that. Being a good cinematographer means finding a beautiful shot wherever you are. Or finding a beautiful shot out of where you are or end up being. That was the name of the game with *Race to the Center of the Earth.* You're basically working and running as hard as possible and trying to get ahead to be set up for something really beautiful that is the quality of what all the past cinematographers of National Geographic have shown us. It was a very high standard.

It was beautifully shot, beautifully done. Usually a reality show is not so spectacular.

That was the mandate of what not to be. We didn't want this to be a regular reality show where it's just all bets are off and the cinematography doesn't matter. This was meant to be a cinematic, beautiful experience into the world that most people don't see all the time.

Good for you. It really showed.

I can't take all the credit. All the camera people who worked on the show are amazing cinematographers in their own right. I've worked with most of them for years. A lot of them came from *Amazing Race*. The funny thing is we all work on similar shows so we know that the cinematography can be, as you said before, not as good as it needs to be. And we all knew this had to be better than those shows. I think it did get there. One of the moments that I remember really vividly is when I jumped off the armored personnel carrier that we were riding in Siberia.

I knew the contestants were going to either turn down the road that we were on or keep going down another road. It was kind

Team Russia treks up the hills of Olkhon Island to their next waypoint. Photos ©f National Geographic.

of like a bet or a hope. And they turned down the way that I was hoping they would. Just as I got off the tank and got my camera set up, I saw this beautiful sunset shot with reindeer being in tow. It was a real moment that wasn't set up and it was just a really lucky moment with I guess some good framing. It's about finding the beautiful image in the chaos.

How was the camera work so steady? Did you have tripods?

We did have tripods in some of the suport vehicles. Usually we had two people hopscotching and one person sticking with the cast or peeling off and then coming back. When it was your day to run with them, then the other two would try to get ahead. And they had tripods to set up for really beautiful shots. The terrain determined what we were doing. If it was all of us with handheld cameras, then that was what it was. If we were on the side of a mountain, then I'd be rigged in and going down with them or climbing up. On a via ferrata (climbing route with a fixed line), you climb up past them and then shoot looking down or as as they go by and then climb up again, over and over.

Did you have safety climbers with you?

Yes. There were a lot of great safety people, making sure both that I wasn't going to do something crazy and also the contestants. I have a little bit of experience climbing and our contestants had very little. So, it definitely was important having good safety people.

Let's get to the equipment, which interests us all. Why don't we start with the cameras.

The Blackmagic URSA Mini Pro 4.6K G2 cameras did a great job. Bertram and I had seen information about it while we were in pre-production. He asked if I'd ever used it and I hadn't at that point. But I had talked to the Blackmagic folks at trade shows many times and had always been interested in what they were doing with being able to shoot in RAW at a reasonable data rate. I asked them if we could test a camera for about a week and it did a great job. It had great dynamic range. And it had very few things anyone complained about. No camera ever makes everybody happy. It's a balance.

No cinematographers ever had cameras that they didn't want retrofit.

Exactly.

You only had Blackmagic URSA cameras?

All Blackmagic except for some Panasonic LUMIX S1H for extreme climbing sequences where we needed a smaller camera. We also used the S1H cameras for nighttime scenes because of their dual native ISO and excellent performance around campfires.

Better for low light than the Blackmagic Pocket Cinema cameras?

At that time they didn't have the Blackmagic Pocket Cinema Camera 6K that is great in low light.

And for sure, you had URSA Mini Pro 4.6K G2 cameras because the URSA 12K had not come out yet. Tell us about lenses.

Bertram van Munster and crew onboard filming the finish line buoy at the center of the earth—Hawaii. Photo courtesy of Bertram van Munster.

We mostly used the Canon 17-120 PL mount Cine-Servo Zooms. Also the Canon 25-250 Cine-Servo. For primes, we had Canon CNE primes modified with PL mounts. For the S1H, we had an L Mount to PL adapter.

So the URSA G2 cameras were fitted with PL mounts. How many cameras did you have?

There were 17 URSA G2 cameras. So, three camera operators in each country, one backup body for each country, and there were four countries. And then we had one extra body back in LA that they could send out in case somebody had a further issue. But we actually ended up not having any issues. I did a thorough month of testing, running the cameras for hours, before we left for the show.

Each camera operator sets up the camera the way they want it. It's got a bunch of Velcro all over it and you're making things that adjust to your body. And then you do a shake test and you just shake the camera like crazy for 30 seconds to see if anything falls off and see if it still works because that's basically that's going to happen for the next month.

A lady I've worked with for a while makes a camera wrap with little holes for the buttons. Audio receivers are Velcroed onto the dumb side of the camera and held in by this bikini. Nothing's left by chance to fall off. It's like a little camera burrito that doesn't fall apart.

It doesn't overheat the camera?

There are little holes for the fans to vent. We also built in a place to stow a rain jacket on the bottom. If it starts to rain and you're out in the middle of nowhere, you just unzip the little pocket on the bottom, pull out the rain cover, and open it over the camera.

What accessories did you use to endure long hours of handheld shooting? What do you have for a handgrip?

Normally you would have a handgrip. But we just used the Canon Servo grip on the zoom lens. A lot of people used the Blackmagic shoulder mount. I didn't. I just use a little Letus35 Master Cinema Series leather camera pad. More often, I remove the shoulder pad and just have the flat camera bottom on there. I think half the battle with shooting adventure cinematography is keeping your camera weight low. The URSA G2 was just in that range where it wasn't too heavy, it was on the line of just okay.

We had the SSD drive sandwiched on the back between the camera and the battery. That pushes the battery further back and makes it about the same length as a normal shoulder cam-

Team South America on snowshoes in a snowstorm. Photo © National Geographic.

era. There's something about the balance that is worth the extra weight. Maybe it's from years of *Amazing Race*, you run around with a full size camera on your shoulder and find it easier to make things look smooth than running around with a small camera. Often we just recorded to the CFexpress cards that fit inside the camera. We had a SmallRig top handle and side cheese plate that was basically to provide a flat spot to Velcro the audio receiver to the camera.

You're recording 24 fps Project Frame Rate? And a lot of slow motion?

So, that was one of the nice things about the camera. You basically had a one-touch 4K 120 fps that you could jump into really quickly. And that made it easy to in the same moment shoot a 24 frames clip as they're running towards you, stop record, push this other button, and push start record and get a slow motion clip of the same scene.

You were shooting Blackmagic RAW? In what quality?

We shot in Constant Quality Q0, which is about 3:1, and with the Extended Video LUT.

Please explain how audio was done.

We had a wireless transmitter backed up by a little body pack on each contestant. We could hear them talking when we were close enough. A lot of the time we'd get a quarter mile or more away and you can't really hear what they're talking about at that point unless there's some magic of the sound gods happening. The audio went to the sound recordist's mixer and then also to the camera. There was two sound recordists for each country.

You also used the stereo internal mics built inside the front of the camera as further backup?

Yes and you can also totally hear all the camera operators probably grunting the whole time they're scrambling a mountain.

How did you slate or sync audio?

We did slate quite a bit. It didn't happen all the time, but it was definitely an effort that tried to be made. But it would be more of a slate in the beginning of the day and then after you're stopping and starting. Everybody had little Tentacle Syncs on all the cameras. Even the S1H had a Tentacle on it. On the URSA, it fed into the time code port. The S1H also has a timecode port. That was one of the reasons we chose that LUMIX because it's flash sync port doubles as a timecode port. So, you get a little flash sync to HD-SDI cable.

Photo by Rob Antill, Digital Anthill.

If the contestants are living out in the open or in tents, where is the crew living?

We camped alongside them. Most places did not have a hotel close by. The production coordinated having camps already built so we didn't have to build the tent, but we did have to sleep in it. They did a pretty good job of supporting us, which was nice. But it was a pretty small team of people. Each country had two producers, basically a competition producer, a story producer, and a logistics producer. That person was working with some local production companies in each place to make things happen for all of our teams.

Roughly how big a crew did you have in total on each of the four units?

Probably 10 people per team. There were additional people who weren't on the road with us, setting things up ahead.

How long was the shoot?

It was 23 days. Each day was almost like a new episode. There were 13 days in country and then we got to the end in Hawaii and there were a handful of days there. And then there was a bunch of travel days in between. It was an every day, all day kind of thing.

Did you view through the camera's eyepiece or with the on-board monitor?

The viewfinder is quite good—great quality. Maybe it's not possible with that size of a chip, but I would love it if the diopter were set a bit larger so that when you have the camera further away, you don't have to flip out the monitor screen that doesn't articulate as well to see the image. You can still be a foot away from it and see what you want to see. Because now, you have to shove your head against the viewfinder.

And then it fogs up?

Oh yes, that's a whole different problem, especially when it's cold outside.

What do you do about that?

A lot of times we'll have hand warmers taped directly to the eyecup. It's always hot and it doesn't really affect the performance. We do the same thing when it's in a hot and steamy wet atmosphere. For example, on "Amazing Race," you'd run off the super cold plane into a hot atmosphere. So, we tape three or four hand warmers to the lens so that the lens elements never get fogged up. The lens is pre-heated on the plane and then you take it into the new country and you can just keep working instead of having to acclimate the lens to the hot atmosphere.

What kind of cases and packs do you have for the gear?

To get it to location, we have normal Pelican cases. Once there, we have Mammut backpacks that we have outfitted out with some foam. So if you were carrying a lens or you wanted to shove your camera in there to hike up a mountain, then we had these alpine

backpacks that we turned into camera backpacks.

Who handled the data each day?

We had a DIT who was often pushed ahead to deal with the large mount of data that we were chewing through each day. As we were done with media, if we couldn't get it to him during the day, he'd be working on yesterday's footage. Also, the regular ACs would also help manage data. It's an all hands on deck affair.

How did you get started in this business?

I was born in Michigan, grew up in Santa Clarita, California. I went to school for graphic design and then LA Trade Tech. I worked as a glass artist. At a certain point I started doing commercials with a little camera for our local Santa Clarita restaurants. Then I decided to go to film school. As a teenager, I wanted to travel and see the world. So, I would work a lot, buy a car, then sell the car and use that money to travel somewhere. I think I parlayed that love of traveling into a career of traveling.

So, now you get paid to travel adventurously. What more could you want, right?

I've been to more than 100 countries, but I still feel like I haven't been to all the places that I want to go. It's a never-ending desire to see new things. I feel lucky to have done thse things. As long as you're working on something that you feel is important and your time as a person is being used well, I'm happy. I try to work on things that I'm going to be really happy with. Not everybody gets to do that. Working in this career is pretty great.

I also want to say that working with Bertram van Munster is a great experience all the time and especially for *Race to the Center of the Earth* because he gave me a lot of freedom. Coming from a very good cameraman as he is, having shot a ton of shows for National Geographic, and gaining his trust feels good and rewarding.

That is a compliment to you. He said, "I'm really tough on my cameramen."

Which is kind of funny because he's a tough guy. He knows what he wants and he tells you he wants to shoot it this way and that. He screens all the footage himself. He's always been good to me. It's been a pleasure working with him.

Since you're the lead DP, I guess you consult with the other DPs on the other locations as to what the look is that you and Bertram want?

Right. We've all worked together for a long time. But for "Race to the Center," we were trying to do something better than what we've done before. There was a big conversation between all of us about what we wanted to do and how we wanted it to look. It meant curating the show into a different mindset. I think it all worked out.

National Geographic's Race To The Center Of The Earth *is currently available to stream on Disney+.*

Below: Team North America reaches the summit of Mount Norquay. Photo © National Geographic.

Above and below: photos by Said Ramirez.

Dominick Aiello was appointed as divisional senior director of accessories at Creative Solutions, working on Wooden Camera, SmallHD and Teradek brands.

Jon Fauer: Dominick, how did this come about? I've known you for a long time at another company.

Dominick Aiello: I spent 25 years with Panavision — almost half my life. I started in June 1995 at Panavision Hollywood. After about seven years, I moved on to Panavision Woodland Hills. When the Genesis camera system came out, I started spending time with the engineers on accessorizing the cameras. That's where my background in accessories started. It got to the point where I was coordinating with the engineers and our clients to make their jobs easier.

How did you learn product design?

I learned by observation, by watching the engineers at work. One of them was Felipe Navarro. He built the 6x6 matte boxes and other accessories. Al Meyer, Jr. built the accessories for Genesis. When the Sony F55 was announced and we knew that it was going to be an important camera, Haluki Sadahiro and I came up with designs and a list of all the components on a dry erase board. We were able to design and develop F55 accessories very quickly.

What does the current job involve and what do you plan to do?

My job is product management and product design for Creative Solutions. Our goal is to build tools that solve problems for camera professionals. I am constantly talking with camera assistants to get feedback. There are some ACs with incredible ingenuity. I like to visit them during camera prep and on set to observe how they do their job—and try to think of easier ways. Trying to find that answer is the goal. Can we make their job easier? Can we help them go faster from one mode to another? Can we do it with standardized quick release plates? Or with different plates?

Or a dovetail that you struggle with to slide the camera off?

Right. Wooden Camera has its own version of that plate as well, where you can just come straight off the top. Again, it's coming up with those methods after you watch somebody try to put a camera with a big lens onto one of those traditional dovetails. It would be much easier if they wouldn't have to worry about lining up that dovetail, they can just pop it on, position it and tighten it.

Do you find that almost every camera crew person has a different way of working and would love to have their own accessories customized? Is there value in that at Creative Solutions?

Yes, and it's going to be a little bit of time before we can actually step into that world. But there is potential in limited quantity and and rapid customization that we can turn around very quickly. Every camera assistant does the job a little differently. But there are also other aspects. Most camera assistants do not like messy cameras. Cable management is always something important. How do you route the cables? Many camera assistants take pride in what they call a clean camera build. They'll even post some of those pictures on social media. If they have a neat camera, the director and cinematographer appreciate that.

It's not just how they do their job, but how their jobs are perceived by others. It's not just about the camera or the lenses. It's the accessories. It's the little things that can make the difference on the job. That's what my goal is, to help achieve that. I'm also hoping to expand the line.

Where do you think it's going in terms of accessories: one size fits all, or unique designs for each camera series?

I'm aiming to build a system that's stripped down to a single core board for all the power distribution. We're looking to limit the number of internal workings, but the external housing will be customized as needed. That's a benefit for the buyer as well. If they buy an FX9 and an FX6, that same base can move from one camera to the other with just different adapter plates. We're trying to do the same thing on other aspects, but the tops of cameras are ever-changing. Camera assistants need onboard monitors, lens control, transmitters and timecode clocks mounted to the camera. Lens mount adapters are important: with RED going to the RF Mount on the KOMODO and V-RAPTOR, an adapter has to be added if you are using PL mount lenses. With the LPL mount gaining popularity, additional adapters are need. Some cameras are going with lens boards that usually attach with four screws, like DSMC2. But no matter what, mount adapters will continue to evolve and I think that market is still big.

Maybe that's something you want to get into in a bigger way?

Definitely. Now, there are a couple of things that engineering is working on that I'm hoping will be announced soon. We're already into lens mount adapters, but they're taking it up a notch and this will be a stepping stone into future development into lens mount adapters. I think future designed cameras will have a short flange back and then you put on any adapter that you want. I also think lenses are going to go to shorter flange focal depths: with E-mount, RF mount and L-Mount.

In your new role, will you go back to the manufacturers and say something like, "It's a great camera, but wouldn't it be nice if you had more mounting points on your next model?"

A lot of manufacturers already know me because I have been vocal enough to ask for some input on future designs. So the trust is there—built from years of experience and relationships.

Canon EOS R3

September 14, 2021. Canon introduces their latest EOS R series camera, the Canon EOS R3. The original Canon EOS R full-frame mirrorless camera was launched in 2018. With the family growing to include RP, R5 and R6 models, the R system of cameras and RF lenses have taken the lead in mirrorless systems according to recent market statistics.

Canon describes the new camera as a professional-grade camera that bridges the gap between the popular EOS R5 and the Canon flagship EOS-1D X line. Robust and reliable, it was designed for professionals, especially when working in extremely tough conditions.

This is the camera you want when filming Formula One, BMX, skateboarding and fast-moving action. Its autofocus astonishingly recognizes and locks in where you want it. The EOS R3 camera provides very fast and accurate autofocus, especially with fast-moving subjects. The EOS R3 uses deep-learning technology to further enhance eye and body detection for great performance during portrait and action shooting.

With a new 5.76-million-dot and 120 fps blackout-free Electronic Viewfinder, the EOS R3 camera lets you select the initial area for AF tracking by simply looking directly at the viewfinder location where you want to begin AF. With Eye Input AF2 and Servo AF activated, the camera will focus on and track moving subjects at that location in the frame. When Face Detect + Tracking is active, the camera will continue to follow moving subjects around the entire active AF area.

Like the EOS R5 and R6, the camera has improved Dual Pixel CMOS AF II with 1,053 AF Points and evolved EOS iTR tracking down to EV-7.5 for subjects such as eye, face, head, animals, and select cars and motorcycles.

Inside, EOS R3 has a 24.1-megapixel back-illuminated stacked CMOS sensor designed and manufactured by Canon. The sensor is the first of its kind from Canon, and when combined with the DIGIC X processor, delivers a high-speed readout allowing for continuous blackout-free shooting at up to 30 fps in electronic (silent) shutter mode and up to 12 fps in mechanical shutter, with minimum rolling electronic shutter distortion.

The ISO range is 100-102400, expandable up to 204,800 for still images. In addition, the camera delivers up to the equivalent of 8 stops of in-body image stabilized (IBIS) shake correction.

The EOS R3 camera has impressive video capabilities as well.

The camera can shoot 6K 60p RAW and 4K 120p 10-bit uncropped video in Canon Log 3 mode, in addition to oversampled 4K and RAW internal recording.

BT.709, BT.2020 and Cinema Gamut are available. Coordinated 5-axis IBIS helps to correct operator motion or shaking providing image stabilization even when using a lens without built-in Optical IS.

Canon EOS R3

Canon EOS R System: EOS R Cameras and RF Lenses

Additional features of the EOS R3 include:

- RF Mount: 20 mm flange focal depth; 54 mm I.D.
- Canon's next-generation Multi-Function Shoe that is compatible with a variety of accessories including the Speedlite EL-1, and new accessories such as the ST-E10 Speedlite Transmitter, External Mic and Smartphone Link Adapter
- One-piece magnesium alloy design, integrating the body with a vertical grip section
- Weather and dust resistance equivalent to EOS-1D models.
- Mobile File Transmitter application for iOS and Android devices to transfer images without the need for wired LAN.
- Built-in Wired LAN, 5GHz Wi-Fi, USB and Bluetooth.
- Dual-card slots for one CFexpress and one UHS-II SD.

The Canon EOS R3 Full-Frame Mirrorless Camera is planned for November 2021 delivery at a suggested retail price of $5999.00.

For more information, go to: *usa.canon.com*

One CF express and one UHS-II SD slot

Stereo Microphone DM-E1D

New Canon RF 16mm and 100-400mm Lenses

RF16mm F2.8 STM

RF100-400mm
F5.6-8 IS USM

Canon RF16mm F2.8 STM

Canon continues to produce new RF lenses for the EOS R mirroless, full frame camera system. *(See photo at top of previous page.)* The most recent additions are the RF16mm F2.8 STM and RF100–400mm F5.6–8 IS USM lenses.

The Canon RF16mm F2.8 STM is compact, lightweight and affordable. The new ultra-wide, 16mm RF lens has an f/2.8 maximum lens aperture and quick AF (autofocus). This is a lightweight and compact wide-angle lens you'll want for landscape, architecture and travel.

- STM Motor for smooth focusing when recording video.
- Compact and light weight — similar to RF50mm F1.8 STM.
- Minimum focus distance of 5.11".
- Maximum magnification of 0.26x.
- 43mm filter thread.
- $299.99.

Canon RF1 RF100–400mm F5.6–8 IS USM

The Canon RF100–400mm F5.6–8 IS USM is an affordable and easily hand-holdable super-telephoto, full-frame zoom lens. Also, for the first time in a non-L-series lens, the RF100–400mm will accept optional Canon RF 1.4x and 2x tele extenders.

- High image quality, similar to EF 70-300mm f/4-5.6 IS II USM.
- Easy hand-held operation — lighter than EF70-300 IS II lens.
- 100-400mm telephoto zoom range.
- Accepts optional Canon RF 1.4x and 2x extenders.
- F5.6 – F8 variable maximum aperture.
- Up to 5.5 equivalent stops of optical IS and 6 stops correction with coordinated IS.
- Nano USM for high-speed and smooth AF.
- Smooth and nearly silent AF when recording video.
- Close-focus: 0.41x magnification at 400mm.
- 9-blade aperture.
- 67mm filter thread.
- $649.99.

usa.canon.com

Atomos Ninja V+ records 8K ProRes RAW from Canon EOS R5

Melbourne, Australia. August 19, 2021. Atomos released eagerly awaited firmware so the Ninja V+ can now record 8K ProRes RAW from the Canon EOS R5. You can also record 5K ProRes RAW using a Super35 crop.

For the latest firmware, go to *atomos.com/product-support* and navigate to Ninja V+. Download the latest firmware AtomOS 10.68 along with the helpful release notes.

If you are staring at a NO INPUT screen, you have not updated the firmware. Guilty. Apologies to the nice folks at Atomos who suffered panic emails and resisted sarcastic retorts. "But I could have sworn the Info screen said 10.68 and not 10.67..."

Be sure to update your Canon EOS R5 to version 1.4.0 or higher.

The Ninja V+ also requires activation of ProRes RAW if you have not already done so. Go to *my.atomos.com*

Ninja V+ is an 8K RAW HDR Monitor/Recorder with a 1000 nit 5.2" (diagonal) display that is sharp and bright even in full sunlight. The monitor is 1920x1080, and like its little brother Ninja V, uses onboard NP-F L-series (Sony style) 7.4 V batteries. You can also run it with 6.2 to 16.8 V external power. Input is full-size HDMI 2.0 and there's a pass-through HDMI output.

Despite warnings to the contrary, the combination of Canon EOS R5 recording 8K ProRes RAW on the Ninja V+ all day on a hot 88 degree and muggy day in New York City did not cause any overheating problems or glitches. I think the efficiency of ProRes RAW helps. Recording 8K 24 fps on a 500 GB Angelbird SSDmini lasted about 22 minutes.

ProRes RAW Recording from EOS R5 to Ninja V+ includes:

- 8K (8224 x 4336) at 23.98p, 24p, 25p, and 29.97p
- 5K (5088 x 2680) at 23.98p, 24p, 25p, 29.97p, 50p, and 59.94p

Atomos describes the Ninja V+ recording 8K on a Canon EOS R5 full-frame mirrorless camera as a supportive "combination for affordable 8K production that will propel filmmakers to new levels of production. Canon and Atomos have democratized 8K for the masses with no compromise in quality."

Atomos and ProRes RAW

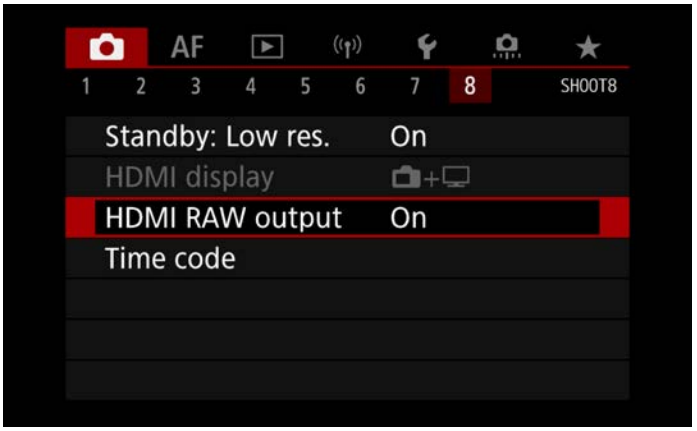
Atomos has been a major proponent of Apple ProRes RAW with more than 30 cameras supported by Ninja V, Ninja V+, Shogun 7 and Sumo 19. Think of ProRes RAW as the digital equivalent of a camera original negative—with efficient data rates, manageable file sizes and great performance. Files are .MOV and they play back with the familiar ease of traditional ProRes. ProRes RAW provokes your inner urge in post to bring up or crush shadow detail, retain highlights, adjust white balance, and correct base ISO.

ProRes RAW works with Final Cut Pro, Adobe Premiere Pro, Avid Media Composer, Assimilate Scratch, Colorfront, FilmLight Baselight and Grass Valley Edius.

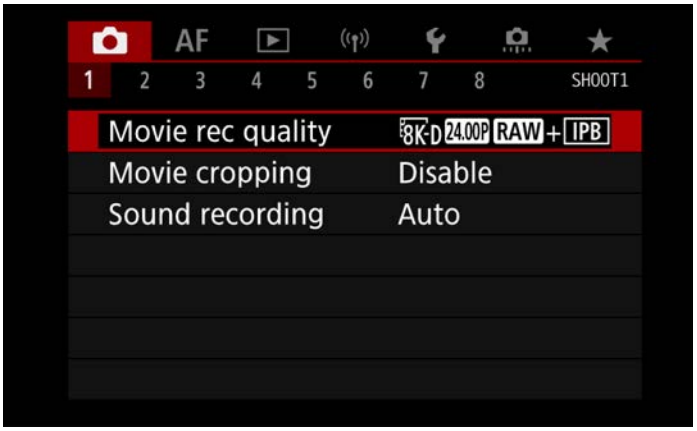
Ninja V+ with EOS R5

Tilt Ninja V+ forward for Hasselblad-style waist-level camera operating.

Canon EOS R5 Setup to prepare ProRes RAW 8K on Ninja V+

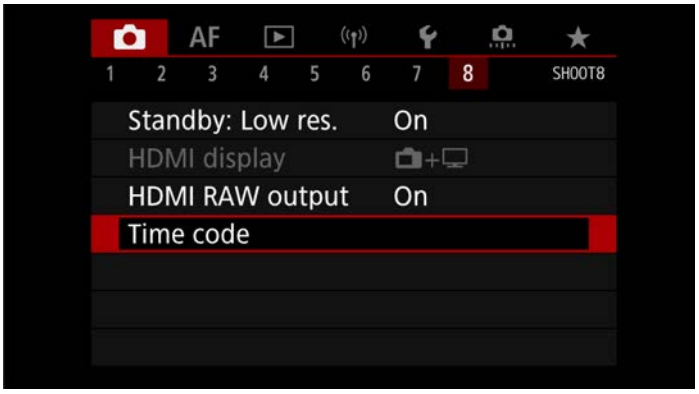


1. On the Canon EOS R5 Menu, go to Shoot Tab, page 8.
Set "HDMI RAW output" to ON.

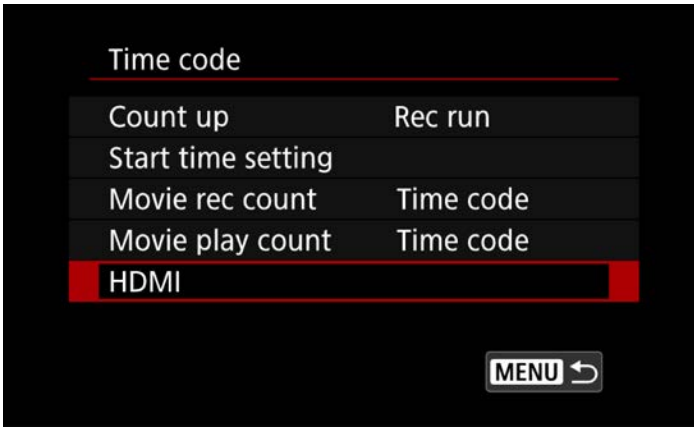


2a. Shoot Tab, page 1: select Movie Record Quality.

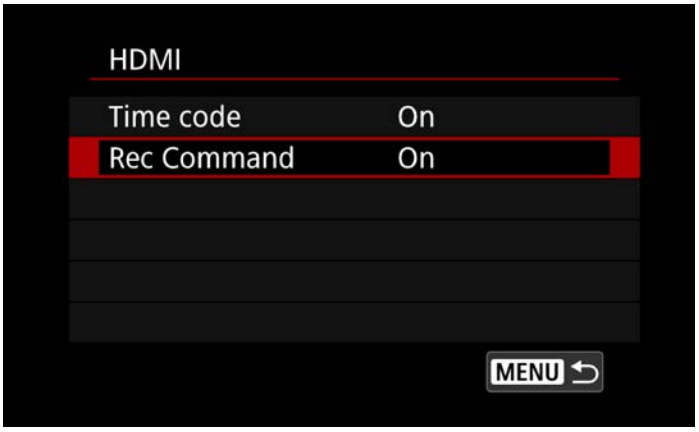
2b. We'll go for 8K 8192x4320 RAW.



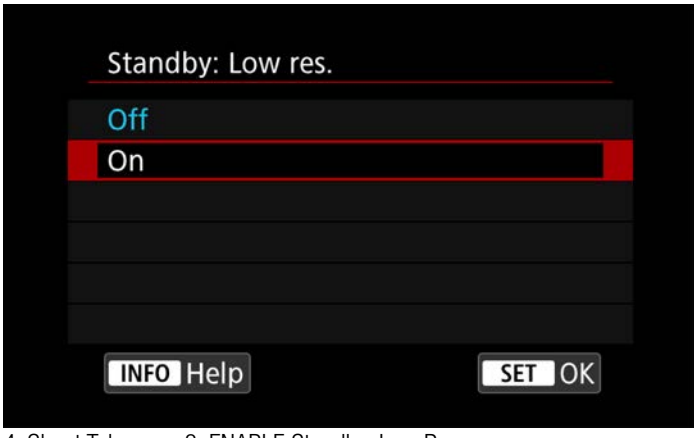
3a. Shoot Tab, page 8: set Time Code



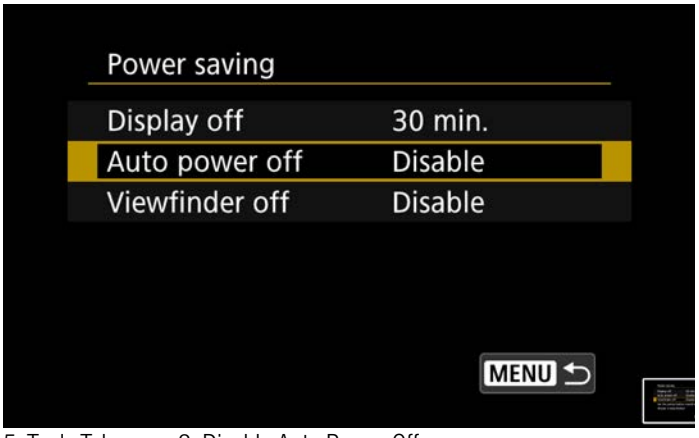
3b. Time Code submenu > open the HDMI sub-sub menu.



3c. Time Code > HDMI> Toggle Time Code and Rec Command ON.



4. Shoot Tab, page 8: ENABLE Standby: Low Res.



5. Tools Tab, page 2: Disable Auto Power Off.

Atomos Ninja V+ Setup

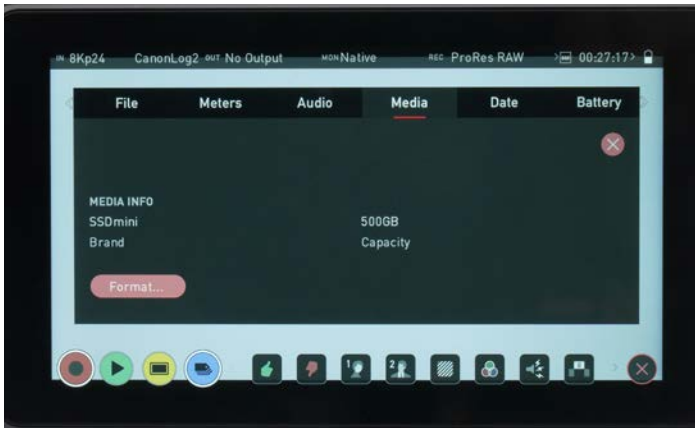
1. Connect the EOS R5 Micro HDMI output to the Ninja V+ HDMI Input and power both ON. Touch OK on the R5 to ignore the HDMI warning. Touch OK on the Ninja V+ to acknowledge that you understand components may get hot, you will not obstruct air vents, and you will ventilate.

2. Touch the top left text in the Ninja V+ information bar. It should indicate IN 8Kp24 since we have set the R5 to 8K 24 fps. Be sure the HDMI Standard is set to COMPATIBILITY MODE. Trigger Source should be set to HDMI and Trigger ON. Set Remote Mode to CALIBRATION/LANC.

3. If you see “NO INPUT” or things are misbehaving, check the firmware version under the INFO tab. It should be NINJA V+ 10.68 or later.

4. Go to the ACTIVATION tab to be sure you have a ProRes RAW license.

5. The RECORD tab is where you can check Codec, Record Format, and Record Time (Space) Remaining on your media.



6. MEDIA is the tab where you can find the button to format your drive. Be sure to use an Atomos certified SSDmini.

Tilta Cooling System

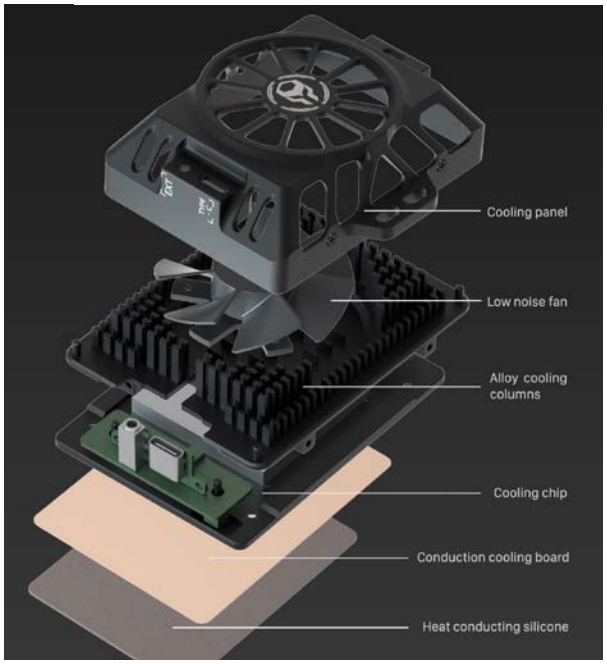
If you are concerned about a camera overheating, Tilta has the Tiltaing Cooling System. This one is intended for the EOS R5, but it probably can attach to any number of hot products with its sticky back. The heat sink part of Tilta's assembly is adhesive, the better to conduct heat away from the camera, sucked in by the fan, and expelled through its vents.

I must admit that the combination of Atomos Ninja V+ recording ProRes RAW from the EOS R5 did not cause any heat problems during our tests on a sweltering New York City day. However, long hours in direct sunlight in the Sahara might be another story.

An Arca-Swiss compatible baseplate attaches to the R5's bottom with a ¼-20 screw. The cooling assembly threads onto the rear of the baseplate. The two-speed fan is powered by a USB-C connector. Its top speed is 5000 rpm at 30 db. Slow speed is even quieter.

Dimensions: 5 x 4 x 3 in. Weight: 4.7 oz.

tilta.com



Chrosziel Zoomer

Shown with 40 mm ∅ gear. A 30 mm ∅ gear is also available.

Sony FX6 and FX9 (as well as FS7 and FS5) cameras have a nice right handgrip with a built-in zoom rocker. The assumption is that you'll use a Sony zoom lens that has an internal zoom motor.

But what if you want to use a photo or cine zoom lens that lacks an internal motor? There are many E-mount Sony, ZEISS, SIGMA, Angénieux and other zoom lenses there for the asking.

Chrosziel's new CDM-UNI-Z2 Universal Zoom Motor attaches to a 15mm lens rod. Connect one end of its Y-cable to the Sony camera's MULTI or 3.5mm port and the other end to the hand-grip cable. The Zoom Motor's Lemo port connects with a D-Tap cable to an onboard battery like Hawk-Woods's BP-98UX.

To change motor direction, hold the handgrip zoom rocker down in the Wide position for at least 10 seconds. To choose among 5 zoom modes, hold the rocker in the Tele position for 10 seconds. The LED blinks 1 to 5 times to indicate setting.

www.chrosziel.com

CDM-UNI-Z2 on Sony FX9 with Chrosziel Lightweight Shoulder Support and ZEISS 28-80 T2.9 Compact Zoom.

CDM-UNI-Z2 mounted to top 15mm rod on Sony FX9 with a SIGMA 24-70 F2.8 DG DN | Art lens. Chrosziel provides adjust-able 0.8M geared bands for the lens.

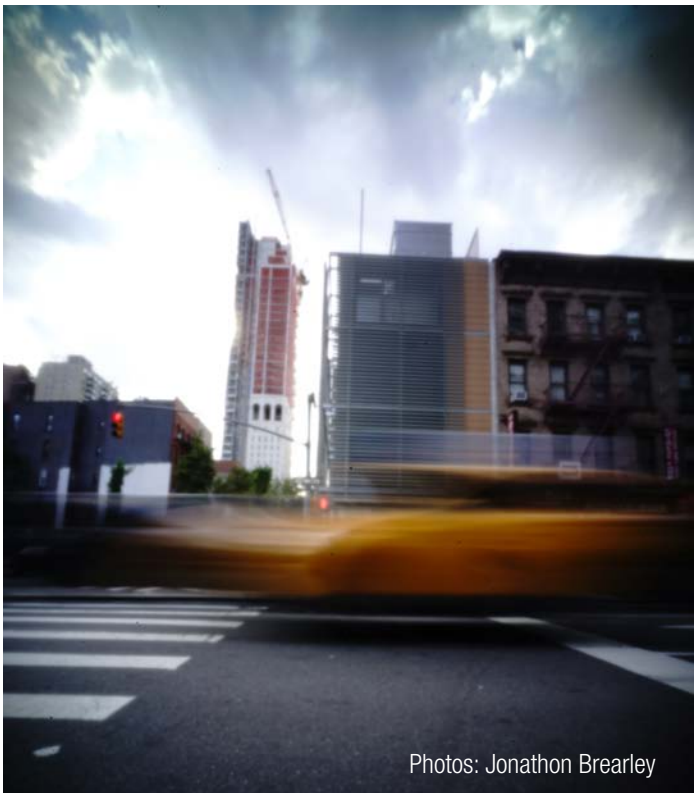
CDM-UNI-Z2 with Angénieux EZ-2 FF 22-60 T3 on FX9 and bottom 15mm rod of a Wooden Camera Unified Base. If the 90° Lemo power connector hits the lens support, use a straight Lemo.

CDM-UNI-Z2 with Angénieux EZ-2 FF 22-60 T3 on top 15mm rod of a Wooden Camera Top Plate for Sony FX9. Camera, lens and accessories provided by Lensrentals.

Lensbaby Obscura 16

Lensbaby Obscura 16mm for Sony E-mount.

The Lensbaby Obscura 16mm is a Pinhole/Zone Plate/Pinhole Sieve pancake lens for mirrorless cameras. Instead of the traditional tiny round hole in a thin and delicate piece of metal, the Obscura is made of three layers of chrome with a total thickness of 0.00014 mm (.14 microns) deposited on 1.5 mm thick glass and then treated with an anti-reflective coating. This photolithography process produces smooth, round pinholes and precision zone plate zones. You can clean the Obscura's glass like any camera lens. The zone plate and pinhole sieve options offer more detail than the pinhole. The zone plate has a curved field of focus, creating a center sweet spot. The pinhole and pinhole sieve have a more uniform look from center to edges. *lensbaby.com*



Photos: Jonathon Brearley

Aaton Cantar X3 with frame.io

Aaton-Digital and Frame.io announce the addition of CantarX3 audio recorders to Frame.io's Camera to Cloud (C2C) collaboration platform. C2C enables productions to securely upload high-quality audio and video files to the cloud automatically with each take. Using Frame.io's integrations into all the major NLEs, creative editorial can begin immediately, expanding the collaboration possibilities of any project.

CantarX3 is a 24-track on-location audio mixer-recorder used on high-end productions such as *Sound of Metal*, winner of the 2021 Academy Awards for Best Sound and Best Editing. As a C2C-certified device, CantarX3 now works with Frame.io's Cloud Devices API to add Frame.io as a destination in the Backup menu.

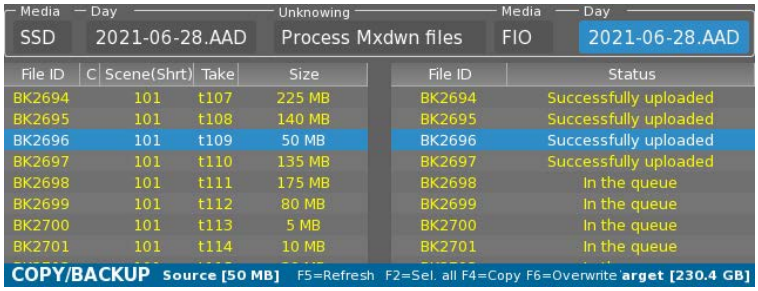
According to Aaton owner Jacques Delacoux, "It was obvious for us to connect our Cantar family with cloud workflow. Rather than develop a proprietary system, we are working with frame.io, a leading company in the field. We're confident in the future of cloud-connected production tools, as high-end productions are adopting this technology."

Michael Cioni, SVP of Innovation for Frame.io, says, "The exploding demand for high-quality original content means shorter cycles and timelines for delivery than ever before. This new paradigm eliminates the need to wait for the syncing process, thereby vastly accelerating the time from capture to delivery."

Use of C2C with CantarX3 is part of a new add-on license developed by Aaton-Digital.

Jacques concluded, "Our developers have designed a secure system based on the excellent C2C protocols, Just pair the CantarX3 on-set, select 'FIO' as the media source, and uploads begin in the background with an on-screen queue available to monitor progress." See screenshots below.

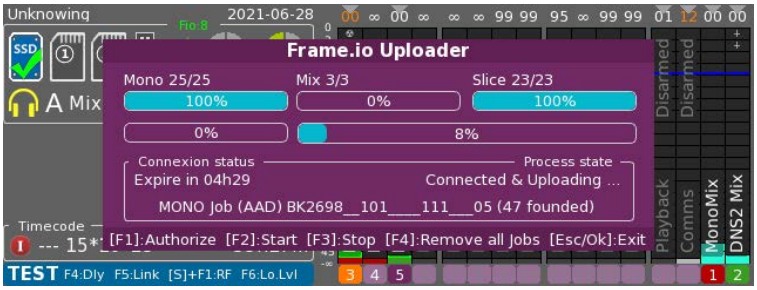
frame.io *aaton-digital.com*



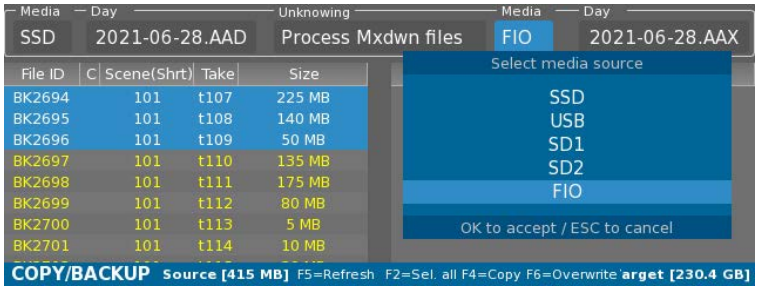
1. Frame.io Monitoring Cloud Queue on CantarX3 Display.

2. Frame.io Pairing Code on Cantar X3.

3. At left: Screenshot of frame.io side of the device pairing.



4. Cantar X3 Uploading to frame.io In Background.



5. Frame.io (FIO) is managed like other media on Cantar X3. Here we see access to the internal SSD, external media and the frame.io cloud.

Angénieux Optimo Ultra Compact Zooms

37-102mm T2.9 Full Frame Angénieux Optimo Ultra Compact Zoom

Angénieux Optimo Ultra Compact Zooms

September 20, 2021. An Angénieux 37-102 Full Frame Optimo Ultra Compact Zoom flew from the factory in Saint-Héand, France—hand-carried to its USA premiere in New York. Enroute from airport to rooftop launch, Jean-Marc Bouchut (above), Angénieux Senior Product Manager at Band Pro, kindly stopped by FDTimes long enough so we could take product photos for this edition. The parking meter was running downstairs. The lens revealed superb center to edge performance, very low distortion, no ramping, and minimal breathing while checking with a PAT Accessories EXA Chart on the wall.

The 37-102 is the first of two new Angénieux Optimo Ultra Compact Zooms. The other one covers 21-56 mm. If the 2.7x zoom range sounds familiar, you probably have been using the iconic Angénieux Optimo 15-40 and 28-76 Super35 Spherical zooms for quite some time. The 15-40 was introduced in June 2005 and FDTimes issue 2 reported breathlessly, "Have you been wishing for lighter, smaller, shorter zoom lenses that make it as easy to shoot handheld, documentary style in 35mm as in 16mm?

Now, 16 years later, that paradigm can be rephrased: lighter, smaller, shorter Optimo zoom lenses that make it as easy to shoot in Full Frame as in Super35. The new Angénieux Optimo Ultra Compact Zooms cover Full Frame with a 46.3 mm image circle. They have a completely new optical and mechanical design compared to the 15-40 and 28-76 Super35 zooms.

September 21, Magic Hour. Fifth Avenue and 55th Street is blocked by barricades, police, trucks, unfamiliar flags and protestors. You enter the lobby of the Peninsula Hotel through an airport style body scanner staffed by TSA and Secret Service. Empty your pockets. Show your vaccine certificate. You are escorted to a private elevator. And you wonder, is all this because of the USA launch of the Optimo Ultra Compact Zooms?

Photo: Yasuhiko Mikami

Well, actually, it is UN week in New York. Delegates and bodyguards rush by. You are whisked up to the Salon de Ning rooftop outdoor event space on the 23rd floor of the New York Peninsula Hotel. Billionaire's Row on 57th Street looms above. Band Pro and Angénieux are there: Amnon and Ronit Band, Nir Reches, Randy Wedick, Brett Gillespie and Veronica Vargas have flown in from Burbank, CA. Yasuhiko Mikami of Angénieux landed from Tokyo. He faces a mandatory two-week quarantine upon his return home, but says it's worth "escaping" for the first time since February 2020. Quite right.

It was a celebration not only of the Optimo Full Frame Family, but also a sigh-of-relief gathering of a family of cinematographers, rental houses, camera operators and friends from the film community. We were bedazzled by the lenses, the setting, the city skyline, the scrumptious hors d'oeuvres and chilled champagne.

And now a word about that. As we munched on miniature crab cakes, John Rule, CEO of Rule Boston Camera, said that he missed the usual Food and Digital Times reports on fine dining and lens metaphor wine tasting. Well, this was the first large gathering I attended since BSC Expo in January 2020. Fine dining since then has been at home with Noemi's amazing feasts along with a steady stream of takeout from Sushi of Gari, Ravagh Persian Grill, Maison Bangkok and PQR Pizza.

Taking up John Rule's challenge, here goes. As the New York Times describes Salon de Ning, "Drinks Are Expensive but the View Is Priceless." We pay homage to the Optimo Ultra Compact and beeline to the bar. A glass of champagne, please. The bartender pours Veuve Clicquot. This is fitting: the champagne that launched a thousand ships and now christens the new lens line. Waiters appear with fashion show frequency. Have a slider on a brioche bun with Gruyère. Perhaps some seared tuna on toast. Skewers of savory chicken saté, slathered with peanut sauce. Try the wine?

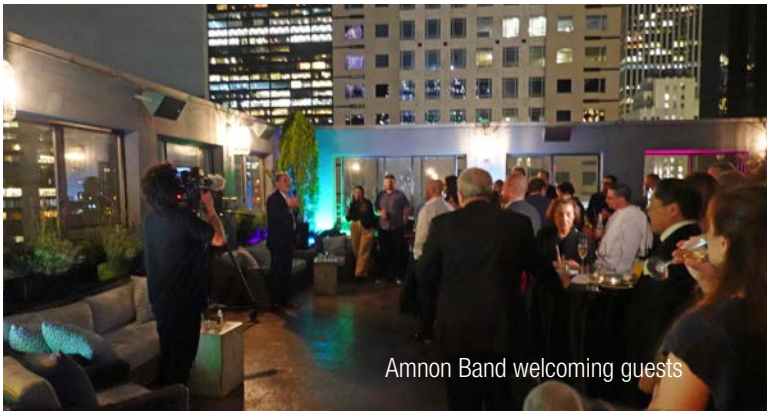
Magic hour gave way to a cerulean blue sky punctuated by thick clouds. The Gypsy Jazz trio played Django Reinhardt standards. Randy Wedick lit the space with Quasar Science Rainbow fixtures, all the better to demonstrate the Optimo Primes' new

Angénieux Optimo Ultra Compact USA Launch

Ronit and Amnon Band


Nir Reches and Yasuhiko Mikami


Ronit Band and UC Zoom


Amnon Band welcoming guests

three-bladed iris option, glimmery-glowy Internal Optical Palette and smooth bokeh of the Zooms.

Amnon Band, President and CEO of Band Pro Film & Digital, took the floor and welcomed the gathering of more than 50 guests. "The Optimo family is growing," he said. "We're really proud of the new Optimo Ultra Compact Zooms. Partnering with Angénieux, the industry-standard Ultra 12x has now grown into a true cinematic family of Optimo lenses. Ultra Compacts represent the missing pieces of the puzzle: pro, lightweight, compact zooms ready to fly on a gimbal, and optically designed to beautifully match the beloved Angénieux look."

Angénieux's Yasuhiko Mikami spoke next, "These lenses are among the lightest on the market. They are excellent additions to the Angénieux high-end Full Frame collection that already include the Optimo Ultra 12X and the Optimo Prime Series.

"The Ultra Compacts' ergonomics, excellent optical quality, Angénieux look and robust, high-precision mechanics are part of a completely new Full Frame design. Image quality is consistent at every focal length and focus distance. The iris goes from T2.9 to T22 and is also capable of closing completely. The balance of contrast, color and resolution offers an appealing cinematic look. Focus and zoom groups are internal and constant volume.

"The Angénieux Type EZ Zooms were one of the first cine zooms in the industry to cover Full Frame. Since their introduction in 2017, they have become the fastest-selling lens within the Angénieux lineup, and have been used in a variety of projects including many high profile productions.

"In a sense the EZs have set the bar pretty high, and it was quite a challenge to develop a new lens to exceed them. The Ultra Compact Zooms optically outperform the EZs, with more sophisticated aspherical elements and more robust mechanics. The EZs were the first Angénieux Full Frame (and IRO-convertible S35) zooms. And now, Angénieux designers, planners and engineers have done something special. This is the second generation of Optimo compact lenses, after the famous Optimo 15-40 and 28-76, which like many second iterations is even better."

Angénieux Optimo Ultra Compact Zooms

Specs: Angénieux Optimo Ultra Compact Zooms

Focal Length	Zoom Ratio	Max. Aperture	Close Focus	Image Circle	Weight	Length [1]	Front Diameter	Object Dims at MOD
21-56 mm	2.7x	T2.9	2 ft 600 mm	46.3 mm			114 mm	
37-102 mm	2.7x	T2.9	2 ft 600 mm	46.3 mm	5.7 lb 2.6 kg	9.25 in 235 mm	114 mm	449 x 237 mm at 37mm 159 x 84 mm at 102mm

- Zoom and focus groups controlled by classic Angénieux rod mechanical guiding system.
- Focus scale rotation: 310°.
- Focus, iris, zoom gears: standard 0.8 Module.
- User changeable focus scales available in Imperial or Metric.
- Passive athermalization from -20°C to +45°C.
- Available in PL mount.
- Front protective optical flat accessory.
- IRO ready (Interchangeable Rear Optics - technology).
- /i Technology metadata via mount or external 4-pin Lemo connector.

1. Length measured from front to PL lens mount flange.

Angénieux Optimo Full Frame Family

Optimo Ultra 12x FF/VV Zoom
FF / VV 36-435 T4.2 (Ø 46.3mm)
Ultra35 26-320 T3.1 (Ø 34.6mm)
Super35 24-290 T2.8 (Ø 31.1mm)

37-102 mm T2.9 Optimo Ultra Compact Zoom

21-56 mm T2.9 Optimo Ultra Compact Zoom

12 Optimo Primes:
18mm T2, 21mm T1.8, 24mm T1.8, 28mm T1.8, 32mm T1.8, 40mm T1.8, 50mm T1.8, 60mm T1.8, 75mm T1.8, 100mm T1.8, 135mm T1.8, 200mm T2.2

Focus Puller extraordinaire Cendrine Dedise with Preston Hand Unit, Preston Light Ranger, Optimo 12x, F65 in the Louvre. Photos © HD-Systems.

Picture this, a Focus Puller's nightmare. You're on a Louis Vuitton fashion show in Paris, inside the Louvre. Fashion models, resplendent in the latest collection by Nicolas Ghesquière, parade in quickstep toward camera, one after the next. Your lens is the long-range Angénieux Optimo 12x, the better to zoom in from wide shot to extreme close-up on the shoes, handbag, belt, dress. Remember, it's Louvre *intérieur,* and he lens is as wide open as it can get. Your depth of field is skinnier than the model's waist, even her index finger. And so it goes, nonstop.

This is not a nightmare. This is the scenario on which Focus Pullers Cendrine Dedise, Tonino de Marco and Cédric Le Donche triumphed, thanks to their prowess and a little help from Preston LR2-W Light Rangers. Here are comments by Lionel Jan Kerguistel, Cendrine Dedise and Olivier Garcia.

Lionel Jan Kerguistel, DP

The Louis Vuitton Fashion shows are multi-camera live coverage productions broadcast on the Internet and Instagram. The configuration and technical logistics (Ephrem Garreau, Odile Brook, AMP) are similar to a big entertainment TV show. But, unlike a TV show, and for quality reasons, we don't use broadcast cameras, and that's the first of the interesting challenges. The show is filmed in 50P, XAVC 4K and RAW 4K.

Another challenge is the location. The sets are often difficult to film both for security and logistical reasons and for their dimensions. This was the case with the Louvre Museum, for example.

The lighting was designed by Philippe Cerceau (from Clair Obscur) with whom I worked closely to adapt the light of the show to the requirements of the filming. The major challenge before the COVID epidemic was that the setting and the lighting were designed exclusively for the public with the constraint that technical and video equipment should be as invisible as possible.

With Olivier Garcia (HD-Systems) as DIT, we created an image identity for the cameras according to the constraints of the set and the light to best meet the wishes of the production and the AD. The exposure levels were managed by the vision engineers before the broadcast. As in classic shooting, I use optical filters to match the different lenses and shape the image in the spirit of a cinema or commercial shoot.

We generally install between 16 and 20 cameras. The main cameras, which we call "Full Look," are Sony F65 cameras equipped

Louis Vuitton Women's Fall-Winter 2021 Fashion Collection inside the Louvre. © Louis Vuitton.

with Angénieux Optimo 24-290 (S35) and Optimo Ultra 12x (36-435 FF) zooms. We use two or more per show. The quality of these cameras is exemplary. We obtain a definition and remarkable color rendering that is faithful to the clothes and the skin tones.

The other cameras are Sony VENICE shooting in Full Frame to limit perspective distortions at short focal lengths and to take advantage of the immersive rendering of the large sensor. These cameras are equipped with Angénieux EZ or Fujinon Premista zooms. Sony F55 cameras are used to limit the weight on certain rigs such as the Spidercam system.

It is called "Full Look" because this is the type of shot in the fashion world where you start with a full wide shot, head to toe, of the model and while the model is walking toward the camera, we are zooming in to get a close-up view—all in the same take. We equipped the Sony F65 Full Look cameras with Preston Light Rangers, which allow us to guarantee a constant and very precise focus on the models. The models walk briskly, towards the camera and on the optical axis. Depending on the setting, the focus distance goes from 40m to 3m and the focal length ranges from 240mm to 24mm when fully zoomed out wide. The transition time between two successive models is only 2 to 3 seconds. This is the most complicated situation for the Focus Pullers, supervised by Cendrine Dedise, who was also in charge of the Preston Light Rangers.

The camera crew consisted of 6 to 8 Focus Pullers, and 6 additional Assistants. There were 16 to 20 Camera Operators and Grips. They operated Steadicam, Spidercam, Towercam, cranes, remote heads and MAX robotic arm. Additionally, there was a DIT, a Data Manager and 3 Vision Engineers. This was a substantial team that had to ensure the proper functioning of these various cinema shooting units, live and without any possibility of a second take. It was certainly enough to guarantee a good level of stress.

After the show aired, it was reassembled and "cleaned," then color graded on DaVinci Resolve by re-linking source images recorded in 4K on each camera. The second life of the film will be on TV monitors in stores.

The Louis Vuitton Cruise shows were quite representative of the challenges of this type of fashion production. Locations included the Louvre Museum and at the Axe Majeur (Major Axis) in Cergy Pontoise, a monumental architectural work created by Israeli artist Dani Karavan in the 80s / 90s. The dimensions of this place presented a major difficulty. The Axis is made up of twelve stations over a length of 3.2 kilometers, including a leaning tower, a set of twelve columns, and a footbridge. It took 10 days of preparation and a day of filming to produce this show, then two days of editing and two days of color grading.

We divided the shoot into three separate sets. "The Gateway" was filmed with a Drone, a Steadicam, a long lens camera and an even longer lens camera (with the Canon 50-1000mm). "The Columns" was filmed with a drone, a crane and a long focal length camera. Finally, "The Amphitheater" was filmed with Jean Chesneau's Robot Motion Control MAX system. This tool allowed director Mathieu Bréchoire to link the two main sets.

The velocity and complexity of these precise movements propelled us into another dimension while keeping the fashion accessories, bags and shoes that we filmed very present. We used a Phantom Flex 4K camera at 150 fps to enable the use of slow motion when needed. FPV drones mounted with Red Komodo cameras made it possible to carry out complex and rapid movements in 3 dimensions along the bridge scenery, which was very long, around 300m.

Focus on Full Look Fashion Shows

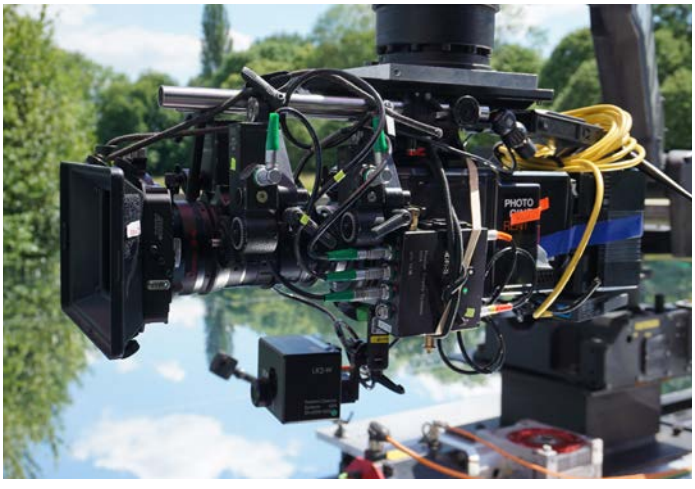
Louis Vuitton Women's Fall-Winter 2021 Fashion Collection inside the Louvre. © Louis Vuitton.

Cendrine Dedise, Focus Puller

I have been using Preston Cinema FIZ systems for over 20 years. The robustness, reliability and a stream of innovations have always been at the service of our focus puller profession. Discussions with Howard Preston are always accessible and reactive. So, we thank him very much for listening to our requests each time. For 3 years now, I have been using the Light Ranger system on feature films and commercials. The Light Ranger has been an essential tool since the arrival of 4K and 8K cameras and especially large sensors. The system is simple to use, quick to prep and allows us to always have control over our artistic decision as focus pullers.

On Louis Vuitton live shows, the "detail" cameras are equipped with very long focal lengths; the models pass quickly in front of the camera and, above all, only pass once! The Light Ranger is used in mannequin tracking for the last 50 feet to ensure maximum and precise focus, ensuring the details of high fashion clothing are sharp even when frozen. For live shows being streamed directly to social networks around the world, this revolutionary tool allows flexibility and the rigor of precision.

MAX, Phantom Flex 4K, Optimo 15-40, LR2-W. Photos © HD-Systems.



Olivier Garcia, on-set DIT & Final Colorist

The detailed shots of the clothing and fashion accessories are very important for the Louis Vuitton brand. Capturing the essence of the fashion designs, without loss of signal information, impose the need for very precise focus. The Light Ranger 2 is an obvious choice for focus pullers. This revolutionary tool is essential for images shot in 4K or 8K with Super35 or Full Frame sensors.

In post-production, during the editing and calibration phase, the Light Ranger 2 allowed images to be at their maximum definition. A live show should never lose focus, which is important for focus pullers, the director and everyone else involved in the production.

On this page:

Framegrabs from the Louis Vuitton Cruise Collection 2022 at the Axe Majeur near Paris.

Watch the Louis Vuitton Cruise Collection show online at: https://youtu.be/1ly14-97QqA

and

https://us.louisvuitton.com/eng-us/magazine/articles/women-cruise-2022-show#

Previous pages:

Women's Fall-Winter 2021 Fashion Show at the Louvre in Paris.

Watch the Louis Vuitton Fall Winter 2021-2022 Fashion Show Paris Louvre online:

https://youtu.be/FVBIcPETT8I

Video and images

Additional Credits:

Show Producer and Designer: La Mode en Images.

Executive Producer: Camera Lucida Productions.

HD-Systems is a Preston Cinema Systems dealer and service center, located in Paris. *hd-systems.biz*

Left, with L Mount

Right

Top

SIGMA 150-600mm F5-6.3 DG DN OS | Sports on SIGMA fp L Full Frame 62.4 MP camera.

If you're a wildlife, sports, stunts and action cinematographer or photographer, a 150-600 zoom should be a constant companion.

Now, there's a completely new SIGMA 150-600mm F5-6.3 DG DN OS | Sports zoom lens. It covers Full Frame and comes in SIGMA/Leica/Lumix L-Mount (20 mm FFD) or Sony E-mount (18 mm FFD).

The result is like an extension of the Olympic motto *Citius, Altius, Fortius*: Faster, Lighter, Smaller, Smarter, Sharper — Together.

The new SIGMA 150-600 and I were happily together for several weeks. This remarkable lens had Autofocus that seemed as fast and joyful as the Tokyo Olympics 100m sprinter Marcel Jacobs. It felt as light as a short zoom and it seemed to reach out to the stars.

Previous SIGMA 150-600 F5-63 DG OS HSM | Contemporary and Sports models have been extremely popular long zooms. However, they were designed for the longer flange focal depth of DSLR cameras and come in Canon EF, Nikon F, or SIGMA SA mounts. You can certainly mount these lenses on mirrorless cameras with SIGMA lens adapters, but the result is slower autofocus. Also, Sport models have typically been larger and heavier, although they endure challenging conditions with dust and splash resistance and an all-aluminum, albeit heavier, barrel. The Contemporary versions have provided versatility with lighter weight materials, but do not provide as robust protection in hostile environments.

And so, as SIGMA CEO Kazuto Yamaki said during his presentation on August 4, 2021, "In designing the new 150-600 Sports lens, we set out three goals: 1. Even better optical quality. 2. Robust Sports Line mechanical specs. 3. Compact and Lightweight."

The MTF chart comparisons in his presentation show impressive optical performance: *https://youtu.be/RL0lfg1dLDI?t=811*

The new SIGMA 150-600 F5-6.3 DG DN OS | Sports zoom lens is approximately 760 g (1.6 lb) lighter and 26.6 mm (1.05") shorter than the previous model. The barrel and body use parts made of aluminum and TSC (Thermally Stable Composite) to shed weight, maintain durability and provide image consistently at different temperatures.

Fast and accurate Autofocus is achieved with an AF actuator controlled by a stepping motor and guided by a high-precision magnetic sensor. You can override AF with smooth manual focus.

SIGMA's 1.4× and 2× L-Mount teleconverters are especially sharp and include AF capability to give you up to a 300-1200mm range.

Optical Stabilization (OS) offers an advantage of approximately 4 stops, which is nice for for hand-held, monopod and windy tripod shooting at slower shutter speeds. The tripod socket is threaded into the bottom of the magnesium Arca Swiss type dovetail lens support. Slide switches offer various zoom barrel tensions, OS modes, focus limits, AF/MF, and custom functions.

SIGMA 150-600mm F5-6.3 DG DN OS | Sports

Mounts:	L mount, E-mount
Lens construction:	25 elements in 15 groups
4 FLD elements (F Low Dispersion = similar to Fluorite)	
2 SLD elements (Special Low Dispersion)	
0 Aspherical lens elements	
Maximum angle of View:	FF 4.1° and APS-C 2.7°
Iris blades:	9, rounded
Minimum aperture:	F22-29
Minimum Focus at 150mm:	58 cm / 22 in
Minimum Focus at 600mm:	280 cm / 110.2 in
Maximum Magnification Ratio:	1:2.9 at 180mm
Filter Size:	95mm Ø
Weight:	2100 g / 74.1 oz.
Dims (L Mount):	109.4 Ø × 263.6 mm / 4.3 Ø × 10.4 in.
(E-mount):	109.4 Ø × 265.6 mm / 4.3 Ø × 10.5 in.

Above: 150-600 with SIGMA TC-2011 2x Tele Converter = 1200mm. Below: Minimum focus 1:2.9 magnification at 180mm. Photos: Jon Fauer.

Above: at 440mm. Below: at 600m with SIGMA TC-2011 2x Tele Converter for total of 1200mm. All photos with SIGMA fp L.

SIGMA DG DN | Contemporary | I Series

Sept. 9, 2021. SIGMA Corporation CEO Kazuto Yamaki introduced two new Full Frame mirrorless camera lenses. The SIGMA 24mm F2 and 90mm F2.8 DG DN | Contemporary lenses now bring the total number of "I series" lenses to six.

Mr. Yamaki has an affection for acronyms and initialism. For example, the "fp" in the name of SIGMA's fp camera is short for "fortissimo pianissimo." The latest model adds an "L" and fp L might stand for "film photo Love."

The "I" in "I series" represents "Instinctive Iconic Identity." You might add "Incredible."

"DG" means the lens covers Full Frame.

"DN" denotes mirrorless camera format.

"Contemporary" is one of three SIGMA lens product lines. SIGMA Contemporary lenses are high-performance, compact and lightweight—the kind of lenses you want to take everywhere. More "C" words here: Core concept compact craftsmanship.

Certainly. The SIGMA DG DN | Contemporary I series lenses are tiny. Two of them fit in the palm of your hand. Handling is solid and smooth thanks to full metal housings and barrels. As Mr. Yamaki said, "The I series has a premium build with superb optics and fine mechanics. They are machined individually, manufactured and assembled with high precision and very tight tolerances at SIGMA's Aizu factory in northern Japan. The human hand can tell the difference. The operational feel is superb. Much of this is the result of our experience with cine lenses where we gained the technology and craftsmanship."

If it's a compact and robust photo or cine lens you want, with outstanding image quality from center to corners, you can't get much smaller, smoother or stylish.

The SIGMA DG DN | Contemporary I series lenses come in L Mount for SIGMA, Leica and Panasonic Lumix or in E-mount for Sony cameras.

SIGMA optical and mechanical designers aimed to match the elegant styling of the SIGMA fp and fp L cameras.

The aperture barrel is calibrated with linear-spaced manual stops or you can set it to "A" for Auto Iris. Focus can be changed from silky-smooth manual to Autofocus with a two-position switch on the barrel.

Bokehs are smooth and painterly. SIGMA's lens design team in Tokyo includes ghosting specialists. Their job is to suppress unwanted ghosts by advising the optical and mechanical designers. They analyze in advance with computer simulations. Actual prototypes are then tested in the field. If they find unpredicted ghosting, these ghost busters provide further advice. This process continues until everyone on the design team is satisfied.

Form follows function. These are the lenses you'll put on the cine camera that goes on a gimbal, drone, rig, car mount, helmet, skateboard, ski or stabilizer. If that camera is a SIGMA fp L, after they call wrap for the day's film shoot, you'll flick the top switch from CINE to STILL for an evening at a museum gala.

See the 24mm and 90mm launch: *youtu.be/kunrB2WU7iQ?t=838*

September 9, 2021 is also the 60th Anniversary of SIGMA Corporation. Kazuto Yamaki said "If you asked me who my mentor was, I will immediately give you the name of SIGMA's founder, my father Michihiro Yamaki. His determination, philosophy, poise and conduct as a manager have had a monumental influence over me in many ways."

sigmaphoto.com/60th-anniversary

SIGMA 24mm F2 & 90mm F2.8 I Series

24mm F2 L Mount

90mm F2.8 L Mount

24mm F2 E-mount

90mm F2.8 E-mount

90mm F2.8 L Mount, no sunshade, on SIGMA fp L camera

90mm F2.8 E-mount with sunshade on Sony Alpha series camera

SIGMA DG DN | Contemporary | I Series

Focal Length (mm)	**24mm**	**24mm**	**35mm**	**45mm**	**65mm**	**90mm**
Maximum Aperture	F2	F3.5	F2	F2.8	F2	F2.8
Minimum Aperture	F22	F22	F22	F22	F22	F22
Close Focus (in)	9.7 in	4.3 in	10.6 in	9.4 in	21.7 in	19.7 in
Close Focus (cm)	24.5 cm	10.8 cm	27 cm	24 cm	55 cm	50 cm
Max. Magnification Ratio	1:6.7	1:2	1:5.7	1:4	1:6.8	1:5
Front Filter Size Ø	62 mm	55 mm	58 mm	55 mm	62 mm	55 mm
Length with L-Mount	2.8 in / 72 mm	1.9 in / 48.8 mm	2.6 in / 65.4 mm	1.8 in / 46.2 mm	2.9 in / 74.7 mm	2.4 in / 59.7 mm
Length with E-mount	2.9 in / 74 mm	2 in / 50.8 mm	2.7 in / 67.4 mm	1.9 in / 48.2 mm	3 in / 76.7	2.5 in / 61.7 mm
Diameter Ø	70 mm	64 mm	70 mm	64 mm	72 mm	64 mm
Weight with L-Mount	12.9 oz / 365 g	7.9 oz / 225 g	11.5 oz / 325 g	7.6 oz / 215 g	14.3 oz / 405 g	10.5 oz / 295 g
Weight with E-mount	12.7 oz / 360 g	8.1 oz / 230 g	11.5 oz / 325 g	8.1 oz / 230 g	14.3 oz / 405 g	10.5 oz / 295 g
Elements	13 in 11 groups	10 in 8 groups	10 in 9 groups	8 in 7 groups	12 in 9 groups	11 in 10 groups
Iris Blades (rounded)	9	7	9	7	9	9
Horizontal angle of view, Full Frame, 36 x 24 mm	84.1º	84.1º	63.4º	51.3º	36.8º	27.0º

The versatile 90mm F2.8 DG DN | Contemporary i Series lens close-focuses to 19.7" / 50 cm. Photos: Jon Fauer.

Atlas Lens Co. Orion Series

new 25mm Orion Anamorphic

Gold Band

Atlas Lens Co. 1.6x FF/LF Extender

Atlas Lens Co. has added the new 25mm Orion Anamorphic to their lineup. So now there are 7 Orion Anamorphic 2x squeeze primes. The new 25mm has a widescreen-wide 133° horizontal field-of-view with extremely low distortion. Its close focus is 1.5 feet.

The 31 mm image circle covers traditional Super35 anamorphic 1.33:1 film and digital sensor image areas up to 24.89mm wide x 18.66 mm high. The new 25mm and the rest of the Orion Series cover Full Frame formats edge-to-edge with the Atlas 1.6x LF Extender attached to the rear PL mount. (LPL-to-PL also available. Approximately 1.3 stop light loss.)

Atlas Lens Co. Standard Orion Series anamorphic primes are distinguished by their gold bands around the front of the barrel. The Silver Edition Orion Series have, of course, silver bands.

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

Atlas Lens Co. Orion Series Silver Edition

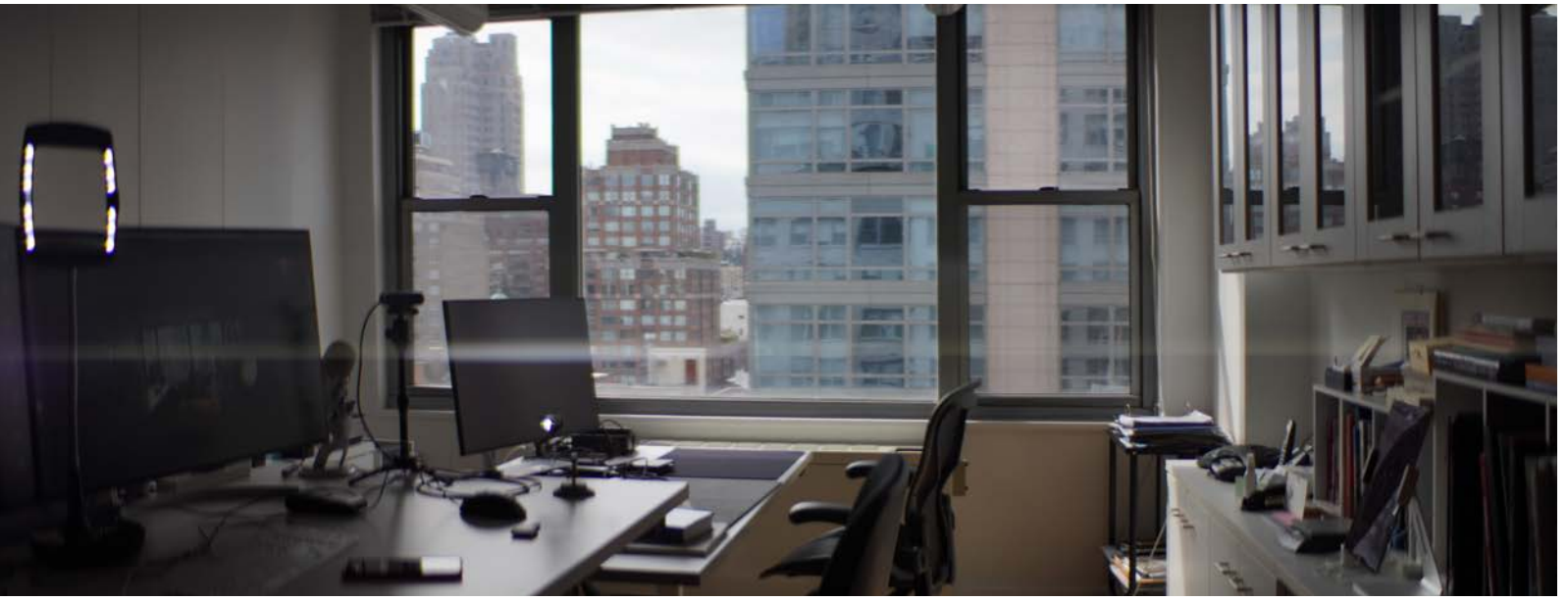
Standard Orion Anamorphic Series characteristics:

- Vintage look.
- Nice spherical aberration glow when wide open.
- Crisp, flat-field performance from T2.8 and higher.
- Cyan and blue streak flares.
- Pleasing barrel distortion.
- Modern mechanics, standardized across all 7 focal lengths.
- Uniform focus and iris barrel position.
- Available in imperial or metric scales.
- Interchangeable mount system with PL installed by default, others available at additional cost.

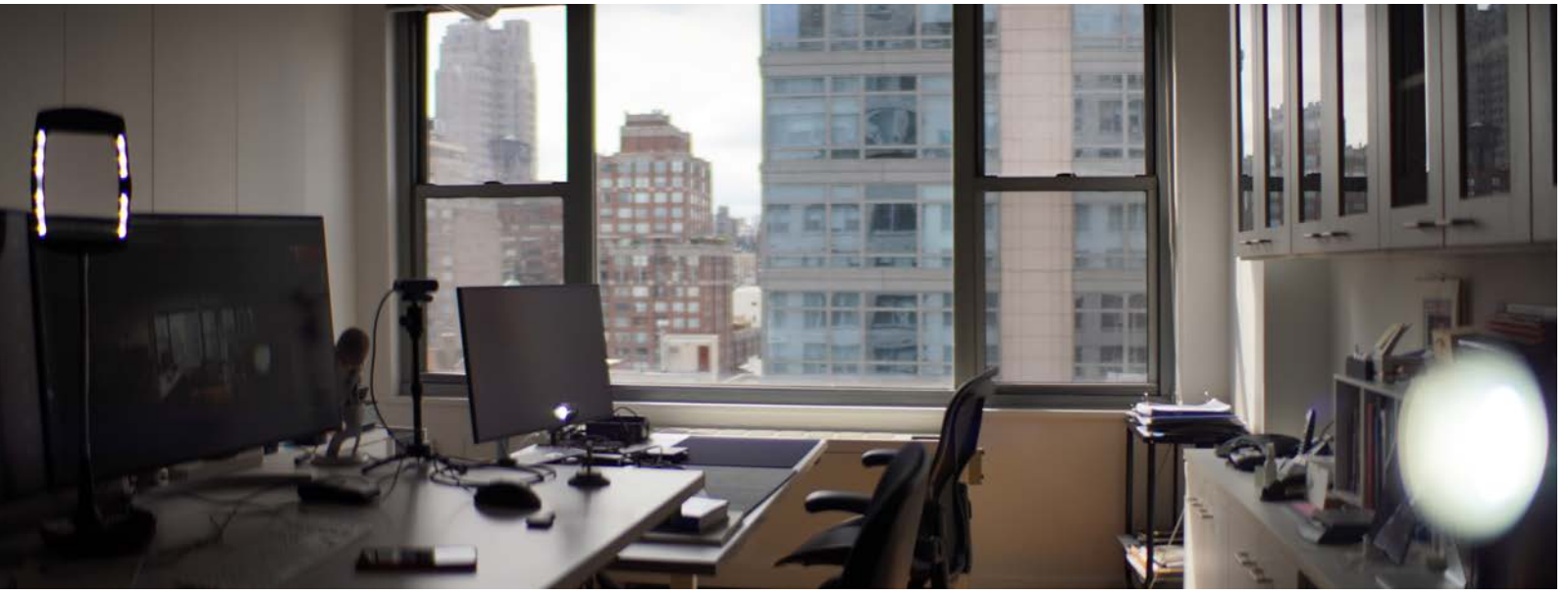
Orion Series Silver Edition characteristics

- Limited Edition of 6 primes (not in 25mm).
- Same apertures, close focus, weight, length, front diameter and image circle as Standard Series.
- Atlas Lens Co. describes the major difference as: "Precision-adjusted air space tuning paired with Silver Edition coatings result in expressive, reactive, yet chromatically refined anamorphic flares."
- Flares are more neutral or take on color of surroundings.
- Different focus fall-off than Standard Series.

65mm T2 Silver Edition S35

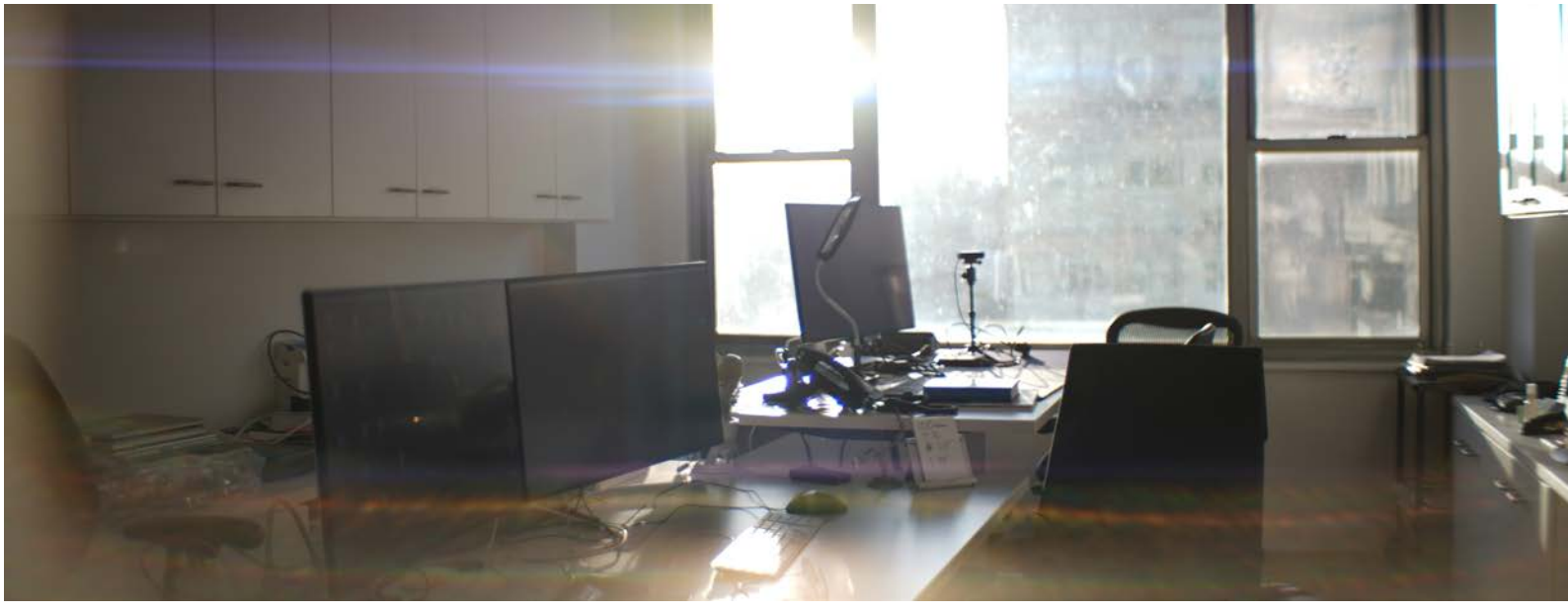


Above: 32mm T2 Silver Edition with 1.6x Expander on a Full Frame sensor. Notice white flare. Below: 32mm T2 Orion w 1.6x FF



32mm T2 Silver Edition Super35 captured on a Full Frame sensor. Notice vignetting at edges—you can crop in post.

32mm T2 Silver Edition with 1.6x Extender on a Full Frame sensor. Below: 50mm T2 S35 Orion.



Left:
Kazimir Malevich, *Black Square.* (1915). Oil on linen.
79.5 × 79.5 cm.
Tretyakov Gallery, Moscow.

Below:
Leonardo da Vinci,
The Last Supper (Il Cenacolo).
1495–1498. Oil on dry wall.
460 x 880 cm.
Convent of Santa Maria delle Grazie, Milano, Italy.

Squares: Albers, Rothko, Malevich, Instagram

Instagram's tyranny of the square, as *Wired* called it ("an endlessly frustrating creative constraint"), has not been, shall we say, a beloved creative format. Quick, how many famous square paintings can you name? Kazimir Malevich comes to mind. He painted "The Black Square" around 1915, described by *The New Yorker* as "the most frightening painting known to man."

Can you imagine Leonardo Da Vinci's *The Last Supper* in a 1:1 aspect ratio? Apostles expunged or endless expanses of ceiling revealed. Instead, Da Vinci composed in 2:1. So does the disciple Storaro. We'll get to Maestro Storaro in a minute.

ALEXA Mini LF 2.8K LF 1:1 Square

And so, why would ARRI include a new 1:1 square sensor mode in their latest ALEXA Mini LF Software Update SUP 7.1?

Shoot with a 2x squeeze anamorphic lens on an ALEXA Mini LF in this new 1:1 (2880 x 2880) format, and the image desqueezes horizontally in a glorious 2:1 widescreen aspect ratio.

Furthermore, this new ALEXA Mini LF 2.8K 1:1 salubrious sensor mode has an image circle of 33.60 mm. How convenient. ARRI/ZEISS Master Anamorphic and some aditional Super35 format lenses conveniently cover this diagonal.

ARRI ALEXA Mini LF Square 1:1 Sensor Mode for 2:1 Anamorphic

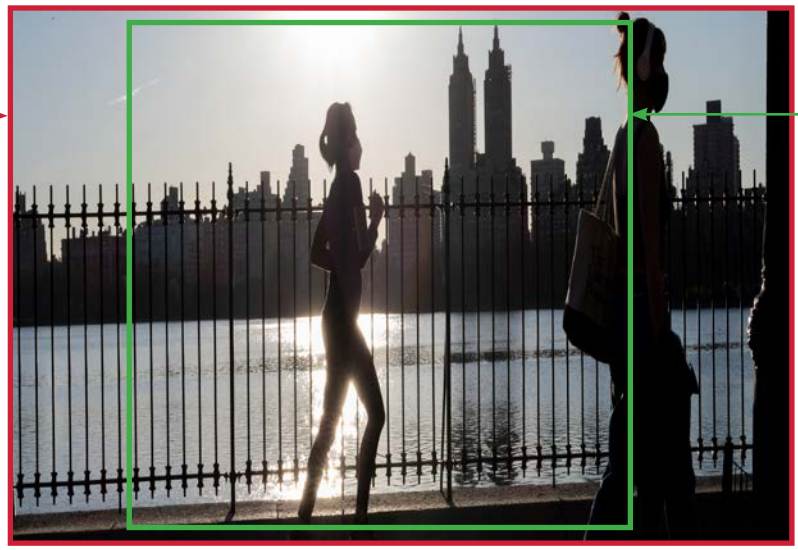
This is the full ALEXA Mini LF **Open Gate 4.5K LF 3:2** Sensor Mode.

(The aspect ratio is actually 1.44:1, but never mind.)

The sensor resolution is 4448 x 3096 pixels and the sensor dimensions are 36.70 x 25.54 mm.

Total pixels: 13,771,008.

Image Circle Ø: 44.71 mm.



Here is the new ALEXA Mini LF **2.8K LF 1:1** Square Sensor Mode.

The sensor resolution is: 2880 x 2880 pixels and the sensor dimensions are 23.76 x 23.76 mm.

Total pixels: 8,294,400.

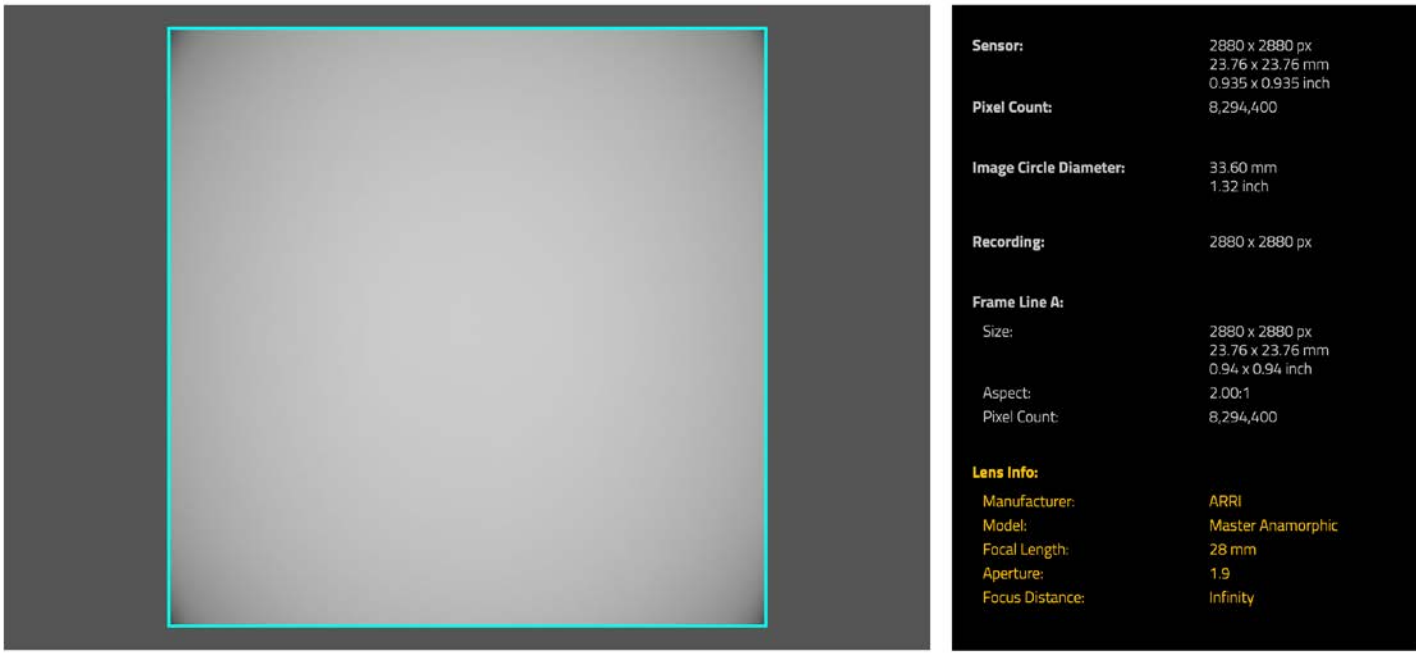
Image Circle Ø: 33.60 mm.

And yes, it satisfies 4K wishes. Explanations follow.

1:1 Square Sensor Mode
2880 x 2880 pixels
23.76 x 23.76 mm.

2x squeezed anamorphic image "windowed" from sensor.

Resulting in a 2:1 desqueezed widescreen anamorphic picture in viewfinder, monitor and on screen.



ARRI Frame Line & Lens Illumination Tool shows 2880 x 2880 Sensor Mode with an ARRI 28mm Master Anamorphic S35 lens. *(arri.com/en/learn-help/learn-help-camera-system/tools/frame-line-lens-illumination-tool)*

The 2:1 display format has gained popularity against widely prevalent and wider 2.39:1 widescreen for a number of reasons.

Ministry of Magic Mandates

Mandates, variously attributed to Harry Potter's Ministry of Magic, recommend 2:1 as being eminently more fitting for televisual, wizarding and handheld devices. Perish the thought of your 2.39:1 anamorphic epic composition compromised by chopped-off edges or dreaded black bands at top and bottom.

Univisium 2:1

Back to Vittorio Storaro, ASC, AIC. Around 1998, he said, "The composition of the image at 2:1 aspect ratio is essential for me. I took the example from Leonardo da Vinci's fresco of Santa Maria delle Grazie in Milan, *The Last Supper*, as the best symbol of Renaissance art with its 2:1 aspect ratio, to invent the 'Univisium' system." This was still in the analog film, pre-digital era.

Producers had to love the cost savings that a 3-perf camera negative offered. ARRI made 3-perf movements for their film cameras. Clairmont Camera and Technovision Rome modified some of their existing inventory.

Producers will continue to love the savings offered by this 1:1 camera format that stretches to 2:1.

Misuse of Muggle Artefacts Office

Meanwhile, back at the Misuse of Muggle Artefacts Office, an additional "you are requested and required" mandate suggests that camera original pixel-count be at least 4K.

And so, ARRI product managers and engineers did the math to show how their new 2.8K LF 1:1 sensor mode qualifies for anamorphic 4K origination. Not only does it dangle the possibility of Large Format 4K, but it also enables all ARRI Master Anamorphic 2x lenses to fill the frame, even though they were originally designed for Super35. (See the ARRI Lens Illumination Tool above.)

Why and How?

But why is this format called 2.8K LF 1:1 if it's 4K we want? The Ministry of Magic 4K Mandate states, "Camera must have a true 4K UHD sensor—equal to or greater than 3840 photosites wide." Elsewhere, it is decreed that "UHD/4K vertical resolution shall include, but is not limited to, 2160 pixels."

Calculators out and ready? 3840 wide x 2160 high is indeed the common 16:9 UHD specification. Multiply 3840 x 2160, and we get 8.29 Megapixels.

Now, look at the horizontal and vertical resolution of the ALEXA Mini LF's new 2.8K LF 1:1 anamorphically squeezed recording format. It is 2880 wide x 2880 high. Multiply: 2880 x 2880 = 8.29 Megapixels. Same 8.29 Megapixels as 16:9 UHD/4K. Even the Gringotts Goblins below the Ministry of Magic might be scratching their heads and nodding in approval.

An advantage of shooting Mini LF 2.8K 1:1 anamorphic is that smaller files are recorded. If you were to shoot ALEXA Mini LF 4.5K LF 3:2 Open Gate ARRIRAW (4448 x 3096), whether spherical or anamorphic, file size increases to 13.77 Megapixels per frame. And you wind up cropping a lot more picture area.

Another reason to like 2.8K LF 1:1 Square is the creative gateway it offers to use S35 Anamorphic lenses for Large Format 4K.

ALEXA Mini LF SUP 7.1

ARRI Release Notes elaborate:

- The latest ALEXA Mini LF SUP 7.1 includes the new 2.8K LF 1:1 recording format in ARRIRAW or Apple ProRes.
- This format is designed for shooting with anamorphic S35 or large format 2x lenses for a target deliverable of 2:1.
- By using a sensor area of 2880 x 2880 photosites, a pixel count equivalent to 4K UHD is achieved, which makes this format usable for productions that require a 4K UHD resolution.

ARRI ALEXA Mini LF SUP 7.1

- This recording format is named "LF" because its height (2880) exceeds the height of an ALEXA S35 sensor (2202 photosites).
- For further details, read the ARRI White Paper "ALEXA LF & Anamorphic Lenses" (*tiny.cc/LF-w-S35*). This is being updated to include ALEXA Mini LF new recording formats.
- The official release of SUP 7.1 is expected in or by September.

ARRI 2.8K LF 1:1 ARRIRAW or ProRes

MXF/ARRIRAW 2.8K LF 1:1. Maximum frame rate: 60 fps. Sensor area: 2880 x 2880, recorded file resolution: 2880 x 2880

MXF/Apple ProRes 2.8K LF 1:1. Maximum frame rate: 60 fps. Sensor photosites used: 2880 x 2880; recorded file resolution: 3072 x 3024. The recorded ProRes clip has black borders (3072 x 3024 pixels) around the picture area (2880 x 2880). These are flagged in the clip metadata and can be cropped, often automatically, in post-production.

Since one of the big advantages of this new 1:1 recording format is the ability to avoid cropping in post, I like ARRIRAW.

SUP 7.1 additional items

ALEXA Mini LF SUP 7.1 includes additional updates:

- Lens Data Archive files for ARRI Signature Prime Lenses and Signature Zoom Lenses
- Sync Shift via Camera Access Protocol
- Various bug fixes and system stability improvements
- ARRI does not recommend updating in the middle of a production.

https://www.arri.com/en/technical-service/firmware/software-and-firmware-updates-for-cameras/alexa-mini-lf-sup

ARRI ALEXA Mini LF Open Gate 4.5K LF 3:2 Sensor Mode

ALEXA Mini LF
Open Gate 4.5K LF 3:2
Sensor Mode.

Sensor resolution:
4448 x 3096 pixels

Sensor dimensions:
36.70 x 25.54 mm.

Total pixels: 13,771,008.

Image Circle Ø: 44.71 mm.

This has been the typical way to shoot 2.39:1 2x squeeze anamorphic on the Mini LF:

Anamorphic squeezed frameline has an aspect ratio of 1.2:1 (because 2.39 divided by 2 rounds out to 1.2.)

You "expose" the entire Large Format Open Gate sensor and crop the left and right sides in post.

The Large Format Open Gate image desqueezes to 2.88:1. The left and right sides, shaded gray, can be cropped so the final picture has a 2.39:1 aspect ratio, as shown with the yellow frame. Prior to the 2.8K LF 1:1 Sensor Mode, you would have to crop even further for a 2:1 release ratio.

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