FILM AND DIGITAL TIMES

Art, Technique and Technology in Motion Picture Production Worldwide

Cover photo of Canon C500 Mark II and vintage K-35 by Jacob Niblett

FILM AND DIGITAL TIMES

Art, Technique and Technology

Film and Digital Times is the guide to technique and technology, tools and how-tos for Cinematographers, Photographers, Directors, Producers, Studio Executives, Camera Assistants, Camera Operators, Grips, Gaffers, Crews, Rental Houses, and Manufacturers.

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

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Contents: Sep 2019 Issue 97

Rembrandt van Rijn, *Portrait of Marten Soolmans,*
Oil on Canvas, 1634. Life size, Large Format (Vertical). 209.5 cm × 135.5 cm.
Slip away from IBC and see Rembrandts in the Rijksmuseum.

Canon EOS C500 Mark II - Full-Frame 5.9K

September 5, 2019. Canon presents the new EOS C500 Mark II.

The C500 Mark II is an exciting new Full-Frame 5.9K cine camera with internal 12-bit Cinema RAW Light recording (among many other choices), interchangeable lens mounts, internal ND filters, speeds to 60 fps in 5.9K and 4K—all in an extremely compact and incredibly lightweight body.

The new C500 Mark II is about half the length of Canon's other Full-Frame cine camera, the C700 FF (introduced in April 2018.) The C500 Mark II is approximately the same size as the original C500. Maybe that's the etymology of the "C500" part of the C500 Mark II name. You might even come up with a nickname, perhaps "C700 FF Mini."

Befitting a body that's half the length of the C700 FF, the new C500 Mark II will be about half the price, at around $15,999.

But Canon did not go halfway on anything else. The C500 Mark II uses the same Full-Frame sensor as the C700 FF: 18.69 megapixels (5952 x 3140), with overall dimensions of 38.1 x 20.1 mm (43.1 mm Ø). Pixel size is 6.4 x 6.4 μm.

The C500 Mark II records 12-bit or 10-bit Full-Frame 5.9K Canon RAW Light and XF-AVC internally from 1 to 60 fps. You don't need a piggyback or add an external recorder.

The C500 Mark II comes with a standard Canon EF mount. Remove four 3mm screws in front, and you can swap it yourself for a PL Mount or EF Cinema Lock Mount. A shim kit is included with these mounts so you can adjust flange focal depth.

The camera has 3 sensor modes: Full-Frame, Super35 and Super16. Cropping is done in-camera. This is nice because you can mix, match or muster an entire collection of contemporary and vintage lenses, from Canon or anyone else, including Canon's Super16 documentarian darling 8-64mm T2.4 Zoom, Canon's Super35 15.5-47mm T2.8 Compact Zoom and the latest Full-Frame Canon Sumire Primes.

Various modules let you configure the C500 Mark II camera for handheld, shoulder resting, full studio regalia, remote, rig, aerial or gimbal mode—with EVF, handgrip, handle, expansion units and other accessories.

Not too long ago, it was thought that Full-Frame cine cameras and lenses had to be 1.5 times or twice the size and weight of their Super35 counterparts. The Canon C500 Mark II is the latest example to confound that theory.

So, the Canon Cinema EOS system that launched at Paramount Studios in November 2011 with the Super35 C300 continues to evolve—with the C500 Mark II as the latest Full-Frame digital motion picture camera, expected to ship this December.

Size Comparison: Canon C500 Mark II and C700 FF Full-Frame Cameras

Front Views

Same Full-Frame,
18.69 megapixel, 5952 x 3140
38.1 x 20.1 mm, 43.1 mm Ø
Sensor

C700 FF

C500 Mark II

Camera Left Views

C700 FF

C500 Mark II

Top Views

C700 FF

C500 Mark II

Canon C500 Mark II — Body Parts

Power ON-OFF Switch

ND Filters controlled by + and - buttons: Clear, 2, 4, 6, 8, 10 stops (Clear, ND.6, 1.2, 1.8, 2.4, 3.0)

Slide latch to open door for access to two CFexpress slots and one SD card slot

REC Start/Stop

Camera Left profile

Handgrip Rosette

Camera Right profile

VIDEO & Power for LM-V2 (included) or EVF-V70 (optional—same OLED Viewfinder released with C700)

Focus Tape Hook

PL Mount

/i Data Contacts

Front - PL Mount

3G-SDI OUT

12G-SDI OUT

Internal Battery Compartment for Canon BP-A30 or BP-A60 batteries

12V DC IN 4-pin XLR

Rear

Front - EF Mount

Top

Bottom

Canon C500 Mark II in Minimalist Mode

EVF-V50 OLED Viewfinder attaches to rear—no cables required.

C500 Mark II with GR-V1 handgrip (comes with the camera) and EVF-V50 ($700 accessory and well worth it.)

Minimum envelope for drones or gimbals: without EVF and handgrip.

Camera Right side: C500 Mark II with GR-V1 handgrip, EVF-V50 and 50mm Sumire Prime Lens.

Canon C500 Mark II — User Interchangeable Lens Mounts

The lens mount attaches with four 3mm hex screws. Users can swap it in the field for an optional PL Mount or optional EF Cinema Lock. Mounts come with a set of shims. Remember: to tighten the PL mount, think "clock(wise) to lock." For the Locking EF mount, it's counter-intuitive: "Counter-clock(wise) to lock."

The C500 Mark II comes with a standard Canon EF Mount. It has pogo pins for lens data and auto functions like AF and IS.

The Canon EF Cinema Lock Mount is a helpful upgrade to securely keep lenses from twisting and adds greater mechanical support.
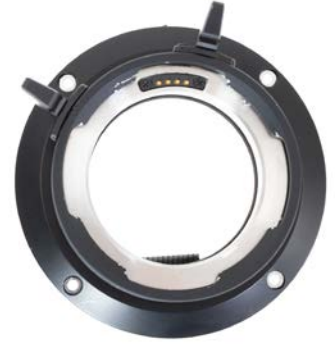
The PL Mount has /i Technology pogo pins at the standard 12 o'clock position and transfers lens data directly to the camera.

Expansion Unit EU-V2, LCD Monitor, Handle, GR-V1 Grip

4.3" LCD Monitor

Handle

GR-V1 handgrip

Camera Left Side

Expansion Unit EU-V2

Bottom View

Canon C500 Mark II Connections

Rear View Camera & Expansion Unit

Monitor OUT 3G-SDI

4K 12G-SDI OUT

Timecode IN/OUT

DC OUT 24V 2A

V-Mount Battery Bracket

D-Tap 12 V DC 50 W Out

Genlock

Remote B

Ethernet (LAN)

Lens Control

Remote A

WiFi

4K HDMI OUT

Microphone IN

Headphone OUT

Audio IN XLR 1

Audio IN XLR 2

12V DC IN 4-pin XLR

Expansion Unit EU-V2 ┊ C500 Mark II Body, Handgrip, Handle, 4.3" LCD
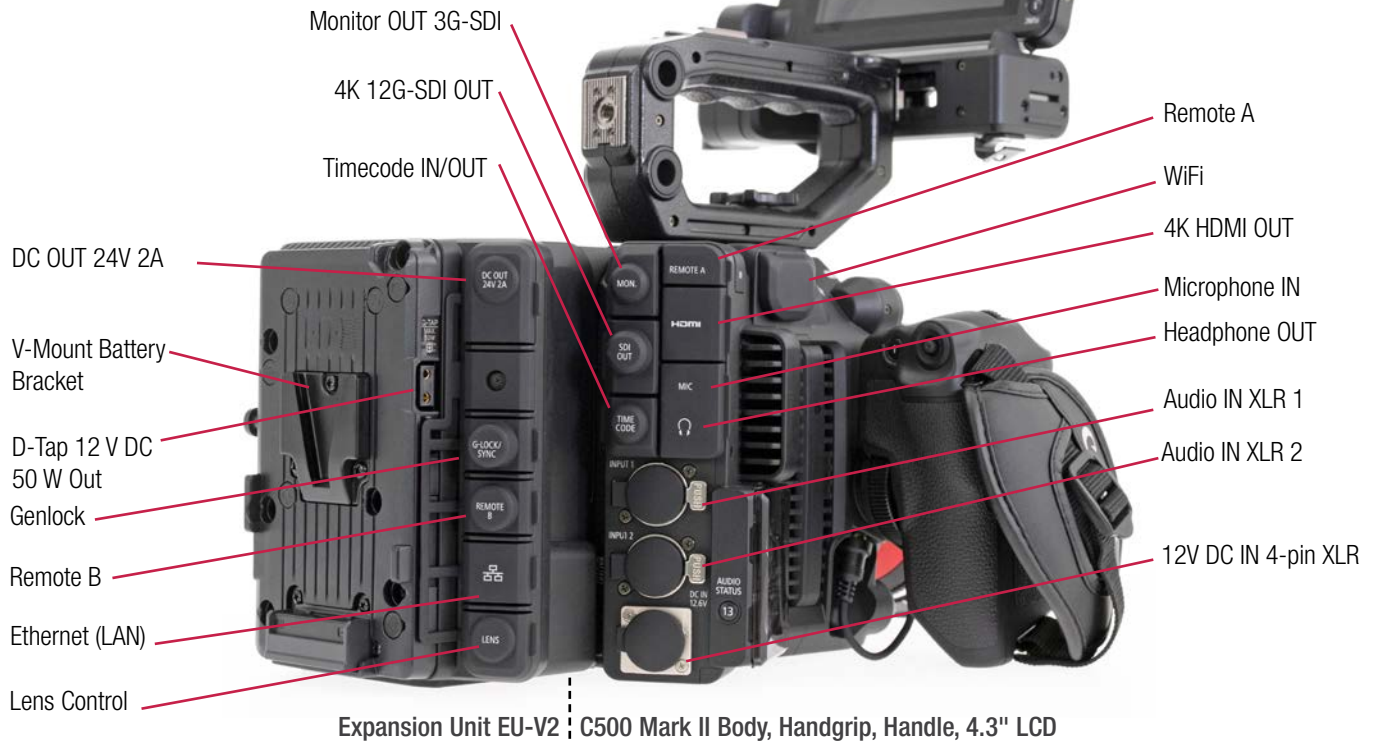
Front

Top View

Canon C500 Mark II Recording Formats and Speeds

Recording Formats

Codec	Resolution	Color Sampling / Bit Depth / Compression	Frame Rate	BitRate	Media
Cinema RAW Light	5.9K DCI	- / 10-bit / -	59.94P, 50.00P	2.1Gbps	CFexpress
		- / 12-bit / -	29.97P, 25P, 23.98P, 24P	2.1Gbps	
	4096 x 2160	- / 10-bit / -	59.94P, 50.00P	1Gbps	
		- / 12-bit / -	29.97P, 25P, 23.98P, 24P	1Gbps	
	2048 x 1080 (2K DCI)	- / 10-bit / -	59.94P, 50.00P	250Mbps	
		- / 12bit / -	29.97P, 25P, 23.98P, 24P	250Mbps	
XF-AVC (H.264)	4096 x 2160 or 3840 x 2160	422 / 10-bit / Intra	59.94P, 50.00P	810Mbps	
		422 / 12-bit / Intra	29.97P, 25P, 23.98P, 24P	410Mbps	
	2048 x 1080 or 1920 x 1080	422 / 10-bit / Intra	59.94P, 50.00P	310Mbps	
		422 / 12-bit / Intra	29.97P, 25P, 23.98P, 24P, 59.94i, 50i	160Mbps	
	2048 x 1080 (2K DCI)	420 / 8-bit / Long-GOP	59.94P, 50.00P	35Mbps	SD Card
			29.97P, 25P, 23.98P, 24P, 59.94i, 50i	24Mbps	

Slow & Fast Motion

Codec	Resolution	Color Sampling / Bit Depth / Compression	Frame Rate
Cinema RAW Light	5952 x 3140 4096 x 2160	- / 12-bit or 10-bit / -	1-60
	2048 x 1080	- / 12-bit or 10-bit / -	1-120
XF-AVC	4096 x 2160 or 3840x2160	422 / 12-bit or 10-bit / Intra	1-60
	2048 x 1080 or 1920x1080	422 / 12-bit or 10-bit / Intra	1-60 (Full-Frame / S35 crop) 1-120 (S16 crop)
	2048 x 1080	420 / 8bit / Long-GOP	1-120

Setting	Available Frame Rates
23.98P / 24.00P	1,2,3,6,12,16,18,20,22,24,26,28,30,32,36,40,44,48,52,56,60,72,96,120
25.00P	1,5,15,17,19,21,23,25,26,28,30,34,38,42,46,50,54,58,60,75,100,120
29.97P	1,2,3,6,15,22,24,26,28,30,32,36,40,44,48,52,56,60,90,120
50.00P	1,5,15,25,34,38,42,46,50,54,58,60,75,100,120
59.94P	1,2,3,6,15,30,44,48,52,56,60,90,120

Canon Cinema RAW Light

Canon Cinema RAW Light was introduced with the EOS C200 a couple of years ago. The latest iteration is now available in the C500 Mark II.

RAW files provide excellent flexibility in post because you are working with unprocessed image data right off the sensor. Typically, those RAW files have been quite large and often required external recorders or expensive media cards.

Canon's new C500 Mark II records Cinema RAW Light directly onto inexpensive CFexpress media cards inside the camera. Cinema RAW Light files are about 1/3 to 1/5 the size of regular Cinema RAW files.

What's the difference between Cinema RAW Light and Log files? Both files start out life as raw sensor data. But, Log files have gamma curves and shooting data baked in. Cinema RAW Light files, on the other hand, are like camera negatives. As such, they have a much greater potential for adjusting things in post: color, brightness, contrast, sensitivity, white balance, shadow detail, highlight retention, and so on.

CFexpress slots A & B

Sensor Modes

43.1 mm diagonal
38.1 mm (5952)
26.2 mm (4096)
13.1 mm (2048)
6.9 mm (1080)
Super16
13.8 mm (2160)
20.1 mm (3140)
1.896:1 (17:9) S35
1.896:1 (17:9) FF
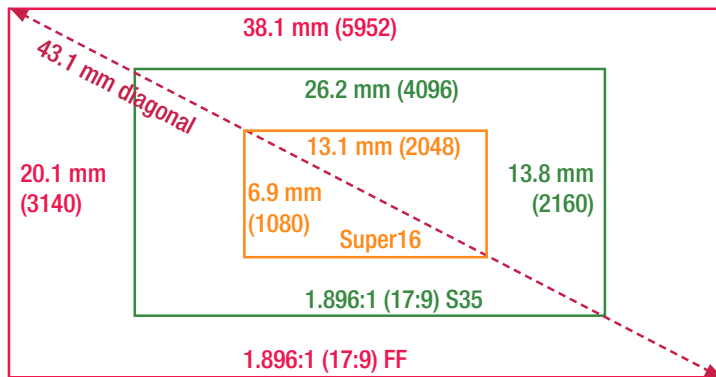
Full-Frame = 38.1 x 20.1 mm
43.1 mm Ø

Super35 = 26.2 x 13.8 mm
29.61 mm Ø

Super16 = 13.1 x 6.9 mm
14.81 mm Ø

Recording Formats: Relative Sizes

5.9K 17:9 (1.89:1 Full-Frame)
5.9K 2.35:1 or 2.39:1 (Spherical Widescreen)
4K 17:9
UHD 16:9 (1.7:1)
2K 17:9
FHD 16:9 (1.7:1)
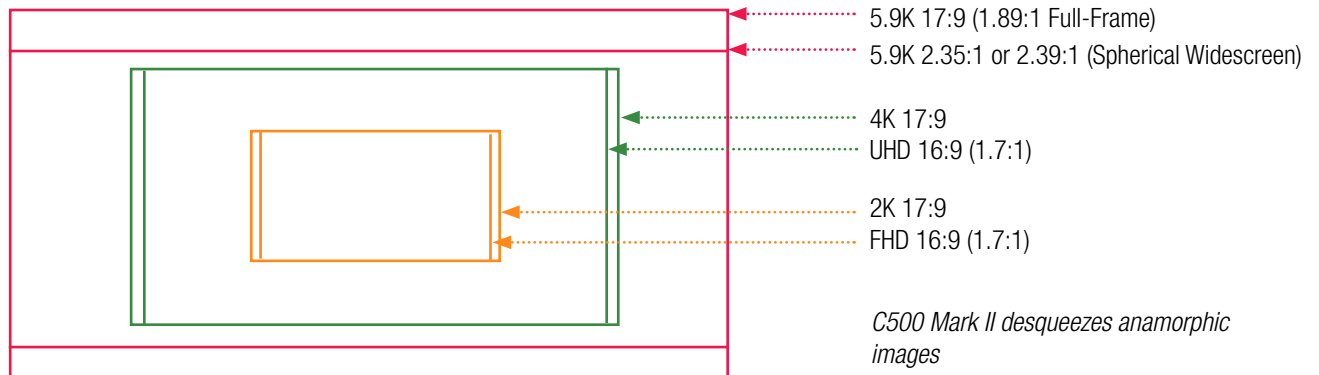
C500 Mark II desqueezes anamorphic images

Canon EOS C500 MKII Specs

Sensor	CMOS sensor with 6.4 x 6.4 micron photosites
Sensor Modes	Full-Frame / Super 35 (Crop) / Super 16 (Crop)
Total pixels	6062 x 3432 (Approx. 20.8 Megapixels - same as C700 FF)
Effective pixels	5952 x 3140 for 5.9K RAW (Approx. 18.69 Megapixels - same as C700 FF)
Effective Image area	38.1 x 20.1 mm (43.1 mm diagonal)
Interchangeable Lens mounts	EF Mount Standard. Optional EF Cinema Lock Mount, PL Mount - user changeable.
ISO	160 - 25,600 (and 100 - 102,400 with expanded sensitivity)
Size	Approx. 148 H x153 W x168 L (same lens center height as C700 and C200)
Weight	3.9 lb / 1750g
Internal ND filters - 5 densities	Clear, 2, 4, 6, 8, 10 (equiv. 10 T-stops with motorized push-button selector: ND.6, ND1.2, ND1.8, ND2.4, ND3.0)
Optional Viewfinders	EVF-V50 OLED Electronic View Finder. 1920x1080 0.7-inch. EVF-V70 OLED Electronic View Finder
LCD Monitor	3.0-inch (7.66cm on the diagonal) color liquid crystal, approx 1.036 million dots.
Recording media	CF Express cards (2 slots) SD card for XF-AVC proxies and JPEG photos
Video formats	Cinema RAW Light (CRL) XF-AVC/ MPEG-4 AVC/H.264
Audio recording	Linear PCM (24 bit- 48kHz) 4-channel
Recording Modes	5.9K RAW Full-Frame 5952x3140 to 60 fps 4K DCI RAW to 60 fps DCI 4K 4:2:2 10-bit to 60 fps HD 4:2:2 10-bit to 120 fps
Gamma modes	Normal / Wide DR / HDR-PQ / HDR-HLG / Canon Log 3 / Canon Log 2
Color space	Cinema / BT.709 / BT.2020
LUTs	BT.709 / BT.2020 / DCI / HDR-PQ / HDR-HLG / ACESproxy / Custom User LUTs 1-4
Slow & Fast Recording	Slow motion 1-60 fps in 5.9K or 4K in CRL (RAW) and 1-120 fps in 2K Cinema RAW Light. 1-60 fps in XF-AVC 4K, etc.
Rear Connectors—Input	Timecode In/Out, REMOTE A, MIC, 2x XLR Audio
Rear Connectors—Output	1x 12G-SDI, 1x 3G-SDI, HDMI, headphones
Expansion Unit EU-V1	Optional Accessory for Genlock In/Out, Sync Out, Remote B, LAN (Ethernet)
Expansion Unit EU-V2	Optional Accessory for Genlock In/Out, Sync Out, Remote B, LAN, Lens Control, 24V DC Out, V-Mount Battery attachment, 2x XLR Audio connectors, Audio gain controls
DC Power In	12V DC XLR 4-pin on camera body
Accessory Power	DC 24V 2A DC 12V 2A D-Tap Connector
Accessories	OLED Electronic View Finder EVF-V70, Remote Operation Unit OU-700, Shoulder Support Unit SU-15, Shoulder Style Grip Unit SG-1, Remote Operation Unit Cable UC-V75, Remote Operation Unit Cable UC-V1000, B4 mount adapter MO-4E / MO-4P Remote Controller RC-V100, Wireless Transmitter WFT-E6, GPS Receiver GP-E1, Unit Cable UN-5/ UN-10, Codex CDX-36150 (Codex Recorder for Canon C700), Codex Capture Drive 2.0 Media
Approximate Prices (may change)	EOS C500 MKII $15,999 expected to ship in December 2019 EVF-V50 $700 EU-V1 Expansion Unit $600 EU-V2 Expansion Unit $1,600 EF Cine Lock Mount with shim set $2,200 PL Mount with shim set $1,600
Contact Canon	usa.canon.com/provideo

These are not final specifications and are subject to change—or worse, are FDT Typos.

Canon EOS C500 MKII Production Stills by Jacob Niblett
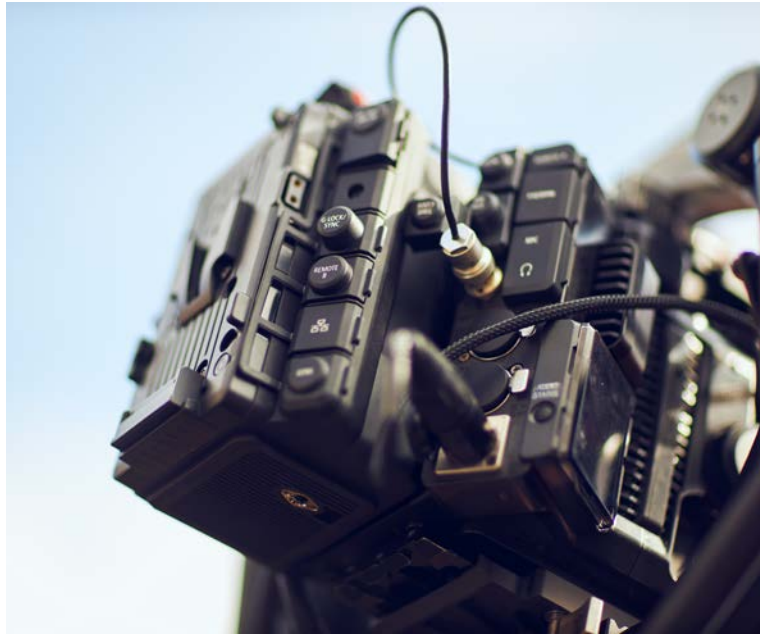
ARRI ALEXA Mini LF

Codex Compact
Drive recording
media bay

36.70 x 25.54 mm
 (Large Format)
sensor with
FSND filter slider

LPL Mount
44mm FFD
62mm I.D.

LEMO 4-pin
LBUS
connector on
lens mount for
daisy-chainable
lens motors
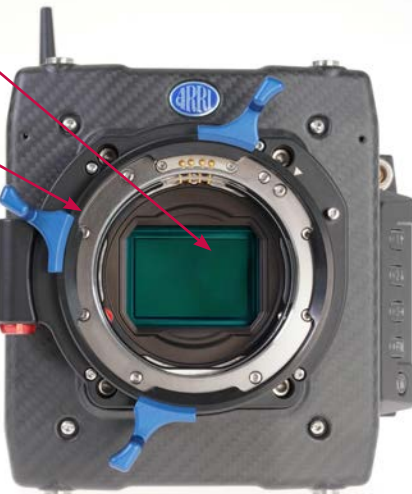
12V 2A 2-pin LEMO

24V RS 3-pin
Fischer

POWER
ON/OFF

ARRI ALEXA Mini LF is shipping now. Guenter Noesner and Michael Best kindly hand-delivered one to FDTimes the other day for the first FDT hands-on and fashion shoot. Only a confirmed camera geek like me could call it a fashion shoot. It was really a day of product shots on a white milkglass sweep.

The report of the Mini LF in April 2019 (FDTimes Issue 93-94) mostly showed renderings of the camera. And, although Johannes Polta is one of the best in the business at creating fabulous renders,   there's nothing like getting ones eager hands on the real camera itself.

The ALEXA Mini LF is thoughtfully designed and meticulously built. Usually the measure of a camera's goodness is to count how many petty peeves you wrote down to send to the engineers. The fewer the better. This time, the page was blank.

Setting up Mini LF from bare carbon fiber camera body to fully fitted handheld mode and then to complete studio configuration takes mere minutes. It's intuitive, logical, fun and brings out the erector set or Meccano mechanic of your youth. This is not a "minor assembly required" affair. It is not fussy. The beauty of the system is how you can add or remove elegantly crafted modules that enhance the experience of each shooting scenario. You customize your camera in ways that would bring tears of joy to the King of the Kustomizers, the California custom car character in Tom Wolfe's *Kandy-Kolored Tangerine-Flake Streamline Baby*. This concept drives directly to the core of what cinematographers crave, which is to have cameras and lenses that feel "bespoke," tailored and unique to a personal style and technique.

So let's take a quick tour of some of the Mini LF configurations. A more complete guide will follow in the months ahead after another visit to the ARRI factory in Munich.

ALEXA Mini LF Favorite Features

- Carbon fiber body and LPL lens mount weigh a mere 2.6 kg.
- New, small, affordable Codex Compact Drive 1TB media.
- Large Format ARRI ALEV III (A2X) CMOS sensor.
- Sensor size: 36.70 x 25.54 mm
- Adjustable EI 160-3200 in 1/3 stops; EI 800 base sensitivity
- LPL lens mount with LBUS connector; 44mm FFD.
- Recording media drive bay is on the camera left side.
- Motorized Large-Format FSND filter slider (Clear, ND 0.6, ND 1.2, ND 1.8)
- New connectors: 12V 2-pin; 24V RS 3-pin; SYNC IN
- New MVF-2 Viewfinder with large 4" flip-out monitor displays the image or menu.
- New VF cable using easier, flexible CoaXPress (up to 10m/33ft).
- Viewfinder has a built-in eyepiece lens heater/defogger.
- Camera works with 12V and 24V batteries (11V to 34V)
- Power draw at 24 fps with viewfinder is similar to ALEXA Mini, which is about 65 W.
- 6 buttons on the camera left side.
- New 6-pin AUDIO connector (2 Ch LINE IN + 12V).
- Recessed Timecode connector.
- 2 built-in microphones.
- One LOCK button each for camera and viewfinder.
- Additional external WiFi antenna.
- ARRIRAW license included.

ARRI ALEXA Mini LF Studio Mode, Top View

ALEXA Mini Viewfinder
Bracket MVB-1

RAB-1 Rear Accessory Bracket with
RAB-1 Clamp 2

Bebob Gold Mount
Power Splitting Box
Mk II, (with 15mm rod
mounting clamp)

Viewfinder Extension
Bracket VEB-3

New Multi Viewfinder MVF-2 with 4" flip-out LCD
monitor, OLED viewfinder display, 1920 x 1080 resolution; diopter adjustable from -5 to +5, eyepiece heater
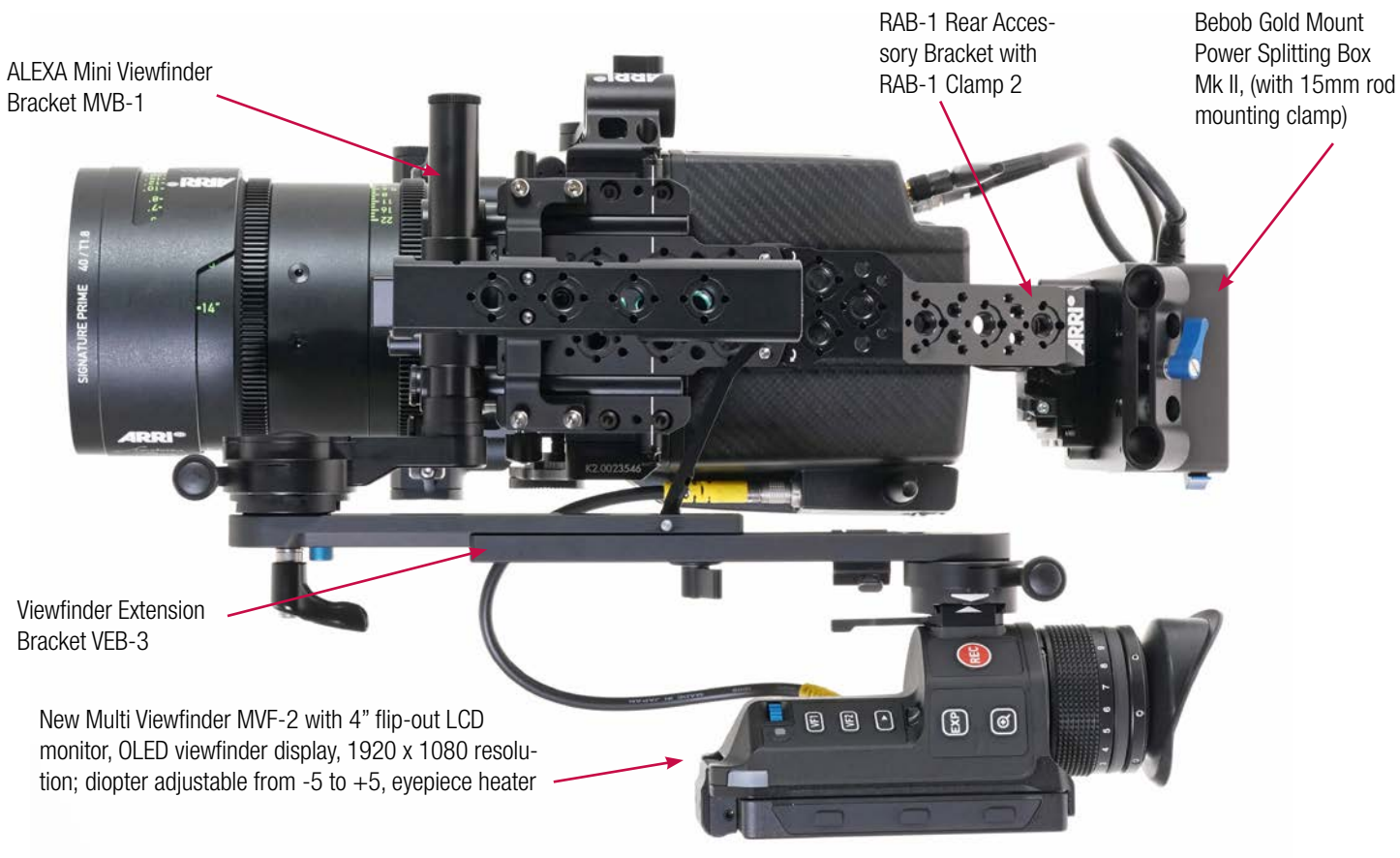
ALEXA Mini LF Handheld, Front View

Cforce Mini Motor

Monitor part of the
MVF-2 flips out here

CoaXPress VF connector
All connectors and cables should be like this.
With industrial CoaXPress connectors,
there's no keyway, so they plug in no matter
which way the connector is rotated.

Master Grip Right
Wheel MRW-1,
controls iris in this
example

Master Grip Left Wheel MLW-1,
controls focus in this example

Stabilizer Plate for CBP

ARRI ALEXA Mini LF Studio Setup

Camera Center Handle CCH-2

ALEXA Mini Side
Bracket MSB-2

Compact Bridge Plate CBP-1 19mm
for ALEXA Mini/ Mini LF

Bottom Dovetail
Balance Plate

Camera Center Handle CCH-2

This Compact Bridge Plate CBP-1 is lighter than a sliding studio bridge plate. It has a
rubber shoulder pad. A quick-release lever lets you open the side and mount the camera
onto the balance plate without having to slide it from the back.

ARRI ALEXA Mini LF Handheld Setup
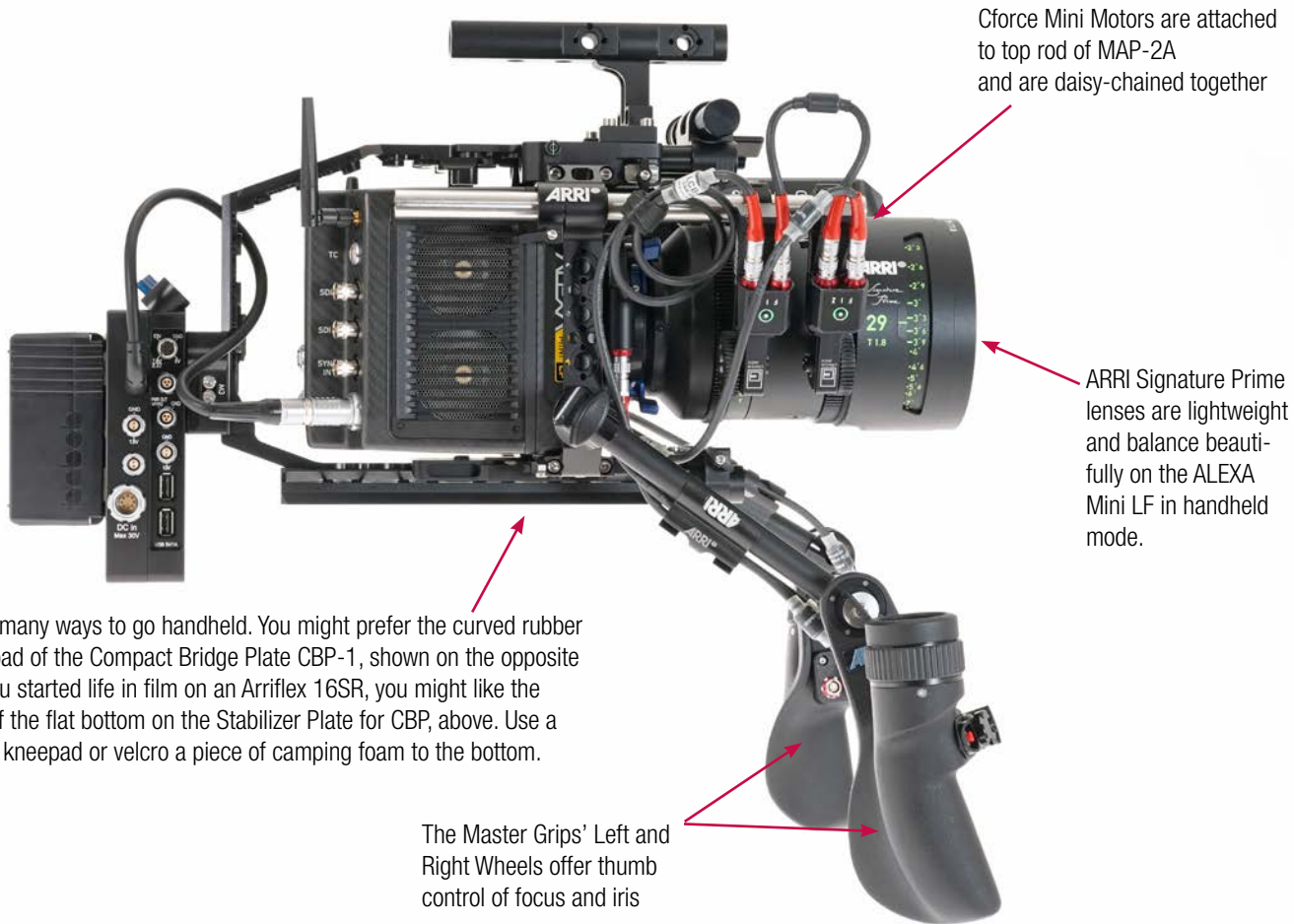
Cforce Mini Motors are attached to top rod of MAP-2A and are daisy-chained together

ARRI Signature Prime lenses are lightweight and balance beautifully on the ALEXA Mini LF in handheld mode.

There are many ways to go handheld. You might prefer the curved rubber shoulder pad of the Compact Bridge Plate CBP-1, shown on the opposite page. If you started life in film on an Arriflex 16SR, you might like the freedom of the flat bottom on the Stabilizer Plate for CBP, above. Use a basketball kneepad or velcro a piece of camping foam to the bottom.

The Master Grips' Left and Right Wheels offer thumb control of focus and iris

Mini Adapter Plate MAP-2A mounted on top with rod for lens motors

Mini Side Bracket MSB-3

Stabilizer Plate for CBP: flat-bottomed handheld plate

Bebob Gold Mount Power Splitting Box Mk II, (with 15mm rod mounting clamp on top)

Servicevison New K35

Those Full-Frame Fanatics from Barcelona are at it again. The same Servicevision team who designed and built the FFA Scorpiolens Anamorphic 2x primes have developed a completely new series of lenses with matching characteristics, flares and bokeh to augment the original, venerable, vintage Canon K35 sets. These new lenses are called NEW K35 by Servicevision.

The set includes a 15mm T1.5 that covers Full-Frame (43.27mm diagnonal), an 18mm T1.5 that covers Full-Frame and RED 8K VV (46.31mm diagonal) and a 100mm T1.4 that covers these and larger formats.

The original Canon K-35 primes were introduced by Canon in 1976 in collaboration with Ed diGiulio's Cinema Products Corp. In the beginning, they came in BNCR mounts (61.47mm FFD) and competed with Zeiss Super Speeds which had Arri Bayonet Mounts. (Neither Arri nor Zeiss capitalized the company name at that time:) Both sets were fast and small. The K-35s had less contrast and sharpness. The K-35 design was among the first to use aspherical elements to avoid spherical aberrations. They had good mechanics for focusing and an iris with more blades than usual.

In 1976, A Sci-Tech Award was presented to "Hiroshi Suzukawa of Canon and Wilton R. Holm of the AMPTP Motion Picture and Television Research Center for the design and development of super-speed lenses for motion picture photography." (Note: Zeiss Super Speeds, introduced in 1975, were also awarded a Sci-Tech in 1976.

Rehoused Canon K-35 primes are popular today. They cover Full Format, have a pleasingly smooth softness and controlled contrast that are not as extreme as some other vintage lenses.

There's a picture of a Canon K-35 on the cover of this FDTimes.

K-35s were used on A*liens, American Hustle, Manchester by the Sea*, and *Barry Lyndon*. The original set of Canon K-35 primes consisted of 18, 24, 35, 55, 85 mm—all T1.5 (although an earlier 18mm was T2.8). The 18mm had a front diameter 110mm. The rest were 80mm. They all covered Full-Frame except the 18mm.

However, there are a few things missing when you want to use original Canon K-35 lenses on a contemporary production. As mentioned, the 18mm doesn't cover Full-Frame; the 24mm doesn't cover RED 8K VV, the 18mm is the widest angle and the 85mm is the longest.

Seeing this market need, Servicevision has developed 3 new lenses based on Canon's original design and look to augment the existing sets of original (often rehoused) Canon K-35s. The NEW K35 lenses by Servicevision including front aspheres like the originals. The new design still uses some optical elements from Canon to maintain consistency with the original set.

With these 3 new focal lengths, Servicevision offers the possibility of expanding and completing an original set of K-35 Full-Frame lenses. With iconic image quality and speed, a combined set of original Canon K-35 and NEW K35 by Servicevision primes should become a welcome addition for the cine market.

At IBC 2019, Servicevision will show a 15mm and a 18mm NEW K35 in their booth 12.C43 which is in Hall 12.

Also at IBC, Servicevision will announce:

- Scorpio 20' telescopic crane
- 20' telescopic crane
- Mini Scorpio Stabilized V (weighing only 14kg and capable of carrying up to a 25kg payload
- FFA Scorpiolens 60mm Macro Anamorphic 2x

Scorpiorama 70 Full-Frame 1.65x Squeeze Front Anamorphics

It is one hour before the FDT IBC deadline. Thais Vallès emails: "Breaking News. Call Pedro Povill. New Anamorphics."

Just when we thought their New K35 were going to be IBC show-stoppers, Pedro presented new Servicevision Scorpiorama 70 1.65x FFA Full-Frame Front Anamorphic lenses. "They have the look of historic 70mm 'Scope productions, with characteristic flares, streaks and the smoothness that you get from front anamorphic cylinders," he said. These are all the right moves. The

1.65x squeeze ratio is like the golden ratio for anamorphic. Fill a 1.5:1 (3:2) Full-Frame sensor like ALEXA or VENICE at 1.65x, and it desqueezes very nicely to 2.39:1 without wasting left and right side pixels in post.

These lenses are small and lightweight. Look at the chart below and see how they are almost the same length as Servicevision's 2x FFA anamorphics and are just a little wider (averaging 110mm front diameter vs. 95mm.) They premiere at IBC in booth 12.C43.

SCORPIORAMA 70 FULL FRAME ANAMORPHIC 1.65X

Focal length		Aperture	Close focus (From image plane)		Front diameter		Length (Front to PL mount)	
	25mm	T2.8	0,5m	1ft 8in	125mm	4,9in	160mm	6,3in
	32mm	T2.2	0.6m	1ft 11in	110mm	4,3in	160mm	6,3in
	40mm	T2.2	0.6m	1ft 11in	110mm	4,3in	160mm	6,3in
	50mm	T2.2	0.6m	1ft 11in	110mm	4,3in	160mm	6,3in
	60mm	T2.8	MACRO 0.3m	MACRO 1ft	110mm	4,3in	220mm	8,7in
	75mm	T2.2	0.7m	2ft 3in	110mm	4,3in	160mm	6,3in
	100mm	T2.2	0.9m	2ft 11in	110mm	4,3in	160mm	6,3in
	135mm	T2.2	1.0m	3ft 3in	110mm	4,3in	190mm	7,5in
	150mm	T2.8	1.0m	3ft 3in	110mm	4,3in	190mm	7,5in
	180mm	T2.8	1.0m	3ft 3in	110mm	4,3in	190mm	7,5in
	200mm	T2.8	MACRO 1:1	MACRO 1:1	110mm	4,3in	220mm	8,7in
	250mm	TBD	TBD	TBD	110mm	4,3in	TBD	TBD
	300mm	TBD	TBD	TBD	110mm	4,3in	TBD	TBD

Covers Full-Frame up to 48 mm Ø diagonal. Specifications may change. Chart courtesy of Servicevision.

AJA Video Systems has shipped Ki Pro GO.

Ki Pro GO is a standalone, multi-channel H.264 redundant recorder capable of capturing up to four simultaneous HD or SD channels to affordable, off-the-shelf USB media. Portable and not requiring genlock, Ki Pro GO is a great product for live productions—including live events, concerts, sports stadiums, corporate, medical, on-set, and more.

Ki Pro GO will also be welcome on DIT carts of motion picture productions. AJA Ki Pro GO is especially adept at recording up to 4 channels of simultaneous H.264 HD and SD from 4 cameras.

Ki Pro GO is the next generation of AJA's Ki Pro family of production-proven, file-based recording and playback devices, combining intuitive design and flexibility into a compact 2RU, half-rack width form factor. Genlock-free recording eliminates the need to synchronize four input sources, while redundant recording provides multiple backups in the field to protect the recorded video. Four 3G-SDI and four HDMI input ports ensure compatibility with high-quality sources. HDMI and/or SDI monitoring outputs enable Ki Pro GO to display up to four channels of video as a matrix monitoring output on a single monitor.

Ki Pro GO features include:

- Multi-channel H.264 recording up to 1080p 60
- 5x USB recording media slots, compatible with off-the-shelf USB 3.0 media
- Redundant recording of any or all channels
- Genlock free video inputs
- 4x HDMI video inputs
- 4x 3G-SDI video inputs
- 4x 3G-SDI video outputs
- HDMI and SDI multi-channel matrix monitoring outputs
- Selectable VBR recording profiles, 4:2:0 8-bit
- Balanced XLR analog audio inputs, mic/line/48v switchable
- 2-channel embedded audio per video input
- 2x 4-pin XLR 12v redundant power inputs
- Easy-to-use web UI, compatible with standard web browsers
- Front panel button controls with integrated HD resolution screen
- Stand-alone operation

Ki Pro GO is available today for $3995 US MSRP. For more information, visit: *aja.com/products/ki-pro-go*

Aaton Intelligent Handgrip, Aaton and Transvideo News

New Aaton Intelligent Handgrip, an iconic design, now with remote camera control, assignable buttons, Bluetooth, Industry-standard Hirth tooth rosette, serial connection, joystick and dial.

The Intelligent Handgrip functions can be assigned with an iPhone and Android app developed by Mikael Lubtchansky at Fool Color.

On display at the French Cinematheque: the first 16mm Aaton (1972), serial number 1, with original, iconic wood handgrip.
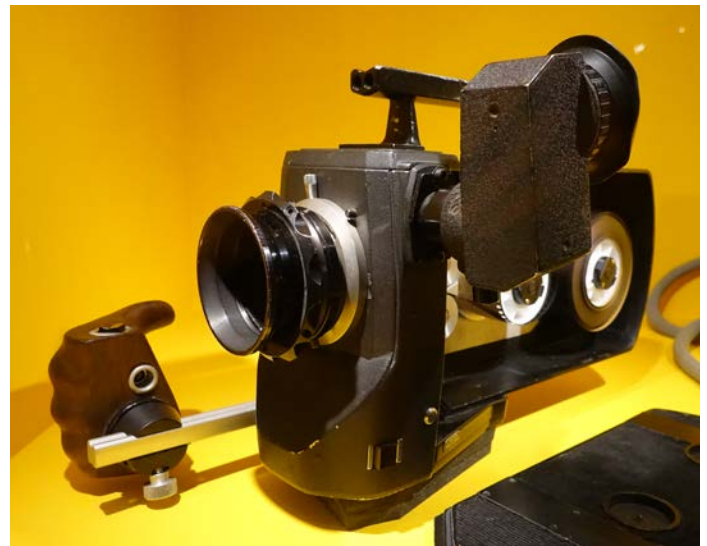
Jean-Luc Godard's 1977 Aaton 8-35. Wood handgrip. Inscribed inside the camera: "Jean-Luc Godard a pensé à vous et vous?"

Who cannot remember the iconic, original wood handgrips made by Aaton for their cameras since 1972?

They were crafted from heather root wood (erica arborea) by an artisan in Saint-Claude, in the Jura Mountains, the global epicenter for making smokers' pipes. Quite a few cinematographers, notably led by Ted Churchill, spent hours sanding and customizing their Aaton handgrips to fit the contours and shapes of their hand. The Aaton handgrip has been "flattered" by many but never duplicated.

Now, Aaton announces an **Intelligent Wood Handgrip** for cameras. It has the original iconic design and includes remote control, advanced functions, electronics and software to remote-control ARRI, RED, and SONY cameras. It has Bluetooth so you can add functions with a smartphone app. The design was done in cooperation with Foolcolor: mikasky.free.fr/foolcolor/

Also at IBC, Aaton is introducing **Melody2**. This new product has a double-input analog audio preamp with low noise and extended bandwidth up to 100 KHz; digital output on AES42; and compatibility with the CantarX3 and CantarMini to extend the number of inputs. The form factor is extremely compact despite the use of high quality audio transformers. The preamp settings are controlled remotely by the Cantar interface. Its compact shape and low weight make it an excellent choice to use on a boom.

New Firmware for CantarX3 and **CantarMini** recorders includes digital gain and limiter for all digital inputs, also on the mixdown. The firmware includes several improvements and is the first step of a major release that will be published at the end of the year.

The new **Transvideo StarliteUltra** is an advanced monitor with metadata collection and recording. The StarliteUltra is a new platform that includes all the benefits of the StarliteHD family, including metadata and the recording features of the StarliteHDm. It also features camera remotes and is the most advanced product available in its category.

Transvideo StarliteHDm monitor/data recorder with new integration of the latest FUJINON Premista zooms and ZEISS Supreme lenses. A total redesign of the COOKE /i interface provides full compatibility with the latest lenses. All static and dynamic metadata from camera and lenses are stored on an SD card.

New firmware for the **CineMonitorHD** with advanced peaking and 6G input ready. A new input board is available to upgrade all CineMonitorHD Evo3 units.

At IBC, Aaton-Transvideo welcomes **Portajib**, **Cinela** and **Film and Digital Times** (hurray!) to their stand 12 F30.

More information: *aatontransvideo.com*

Elisabetta Cartoni and the Cartoni MAXIMA 5.0

Elisabetta Cartoni and MAXIMA 5.0 at the Cartoni factory in Rome.

by Jacques Lipkau Goyard

August in Rome is sweaty, hot and very tiring. This month temperatures have reached highs of 45° Celsius (115° F) with little or no "Ponentino," the famed Roman sunset breeze. Fortunately, locals and tourists can take advantage of the "Fontanelle," the two thousand water fountains scattered around the Eternal city with fresh and clean water still coming from the Appian Way Aqueduct.

That's why, since the Imperial period, Romans tend to leave the city for extended weekends or often for the entire month. But not all can avoid the heatwave. Elisabetta Cartoni, owner and CEO of CARTONI, the Italian leader in premium Camera Supports for Film, Broadcast and Pro-video industries, is stuck in Rome. Film Digital Times interviewed Ms. Cartoni at her Roman factory.

FDT: Why are you are still in Rome with this hot weather?

EC: Because before we go to the even hotter weather in Beijing for the BIRTV show, we have to make sure everything is ready for IBC in Amsterdam.

FDT: What are you presenting at this year's IBC that is different from last NAB?

EC: The "big" surprise is the newly designed MAXIMA 5.0 that we believe can become the next ideal Fluid Head for digital Cinematography with heavy-payload, heavy-duty packages.

FDT: Why 5.0 instead of 50, as I imagine this new MAXIMA outweighs your MAXIMA 40?

EC: The 5.0 is 2 kg (4.5 lb) lighter, one inch shorter than the 40 and has an increased payload capacity of up to 50 kg (110 lb).

We chose to name it 5.0 as the new head reflects the concept of Industry 5.0 over the present Industry 4.0 that represents the fourth revolution that has occurred in industrial manufacturing: the digitization of manufacturing and optimized computerization of the industry. Industry 5.0 is the future, already a penetrating trend, of change processes directing towards closer cooperation between man and machine. The new MAXIMA 5.0 represents the close cooperation between Fluid Head and Camera Operator.

FDT: A challenging concept.

EC: Yes, and we intend to challenge the industry top of the line camera support company: OConnor 25-75. Its fame is well-deserved since Chad O'Connor and Joel Johnson designed a super head responding to the requirements of Camera Operators. When the Vitec group bought OConnor it gave the 25-75 a boost with Hollywood productions and rental houses. But the great 25-75 is not 100% perfect. Picky Camera Operators can detect some issues, as for example, there is a slight gap in the counterbalance performance the very moment you pass the horizontal point and invert the tilt—there is a slight sensation of a hollow point. The OConnor fluid is consistent and precise, but the fluid chambers are not sealed and the head may leak, which is a problem for the rental houses.

FDT: Yikes, you are taking the gloves off and inviting debate. What were the features of the original MAXIMA 40?

EC: At the time we did a good job with the first MAXIMA...technically the counterbalance was perfect throughout the 180° range, and the fluid chambers were sealed to avoid any sort of leak. All

Cartoni MAXIMA 5.0

the settings and levers were in the right place but the head was too big, tall and heavy.

I remember when my father designed the MAXIMA in 2013, he neglected the weight and dimension issues, preferring functional perfection versus practicality. It was a mistake, and the MAXIMA did not take off as we had hoped. Too big and heavy.

FDT: And the MAXIMA 5.0?

EC: Today cameras are shrinking and the size becomes crucial. This is why we went back to work and re-engineered the 40 into the MAXIMA 5.0. The result is a lighter, higher performance Fluid Head. The performance now is outstanding as the new patented cable counterbalance works even better throughout the entire 180° tilt range. No hollow point at the horizontal transition. We achieved this after long hours of work and making mock-ups.

To overcome the tension difference passing from front to rear, our designers conceived of offsetting the racks of pulleys so that the engagement of the front and rear cables works in overlap at small tilt angles. Here too, the fluid modules are hermetically sealed and our constant research on fluid technology made us select a brand new silicon gel produced for aerospace applications. This fluid has virtually no molecular elasticity, so starts and stops are 100% precise and smooth with no backlash.

As the future is today, Camera Operators need more and more position metadata. The MAXIMA 5.0 can be encoded to provide high-res position data for Pan and Tilt from the direct encoders plugged onto the rotation axis. The newly designed 5.0 can be purchased strictly mechanical or encoded. It can also be up-

graded and encoded in any further moment. I believe this new Fluid head is a real improvement to Camera supports and our engineering team, headed by Alessandro Fiore, has achieved a phenomenal job. This time I am confident we can challenge the extraordinary creation of my friends Chad and Joel called 25-75!

FDT: Does it have compatibilities with other brands?

EC: The large sliding camera plate is compatible with ARRI, Sony, and OConnor. The head comes with a telescopic pan bar and a short front pan bar and there is an optional 150mm bowl base that can be easily applied. The knobs and levers are ergonomically placed to ensure camera operators complete ease-of-use in any situation, whether in the studio, location, or outside.

FDT: This has been very intersting

EC: Thank you. As you know, our mission since the times of my grandfather has been to give Camera Operators the best possible support to let them express their creativity. We at Cartoni are constantly improving and researching new tools for these creative operators. Come see us at IBC 2019, Booth 12.E30.

Sony PXW-FX9

Here's an affordable, compact, lightweight cine camera to democratize Full-Frame. With a new companion Full-Frame zoom lens, this system is about the same size and weight as Super35 predecessors and still shoots both formats. Full-Frame cine becomes mainstream. And, history repeats itself.

With days to the FDT IBC deadline, Sony once again has a new camera to roll out. Do the product planners in Atsugi take great pleasure in hearing me plead with the printer in Amsterdam, "Stop the presses?" And, on September 13, 2019, Sony launches the PXW-FX9 Full-Frame 6K affordable shoulder-resting documentary style cine camera.

I'd like to think it is just an inexorable advance of predictable product cycles and converging technological innovation. The FX9 is the culmination of combined E-mount camera technologies, comprising Sony VENICE, Sony Alpha series cameras and the FS7 series.

But let's take a quick trip back in time to see why this camera, the FX9, was inevitable.

Sony launched the F5 and F55 Super35 4K cameras at Sony Pictures in Hollywood on November 28, 2012.

In September 2013, Sony's NEX-VG900 Full-Frame prosumer E-mount HD camcorder came to Photokina. A few weeks later, October 2013, Sony introduced the α7, their first Full-Frame Interchangeable Lens Camera with E-mount (ILCE). That was the seminal moment for what would follow with VENICE and FX9 Full-Frame cine cameras. But we're getting ahead of the story.

Five years ago almost to the day, September 12, 2014, Sony announce the FS7 Super35 4K digital cine camera. It was a breakthrough cinema vérité documentary style, shoulder-resting camera about the size of a 16mm format Aaton A-minima, but a lot lighter. Some of us called it the Sony Minima or Sony Vérité.

And then, another two years later, Sony introduced the FS7 II in November, 2016. The FS7 II had a new Lever Lock E-mount, In-Camera Electronic Variable ND, versatile viewfinder, smarter SmartGrip, and improved interface.

Sony VENICE arrived on September 6, 2017: Full-Frame, 6K.

And now, once again, almost two years to the day, Sony launches the new Full-Frame FX9 at IBC in Amsterdam.

A pattern emerges: a Sony high-end camera is launched—and an affordable version follows two years later. And let's not forget the progression of Sony's alpha series of Full-Frame ILCE cameras, from the a7 to the most recent a7R IV.

Sony's formidable design, engineering and manufacturing prowess makes possible the production of cameras, sensors, processors and lenses at these regular intervals. Here then, is the latest in the Sony line of cine systems, the PXW-FX9.

Convergence of Technology from Sony E-mount Cameras

FS7 introduced September 2014

Cinema Vérité, E-mount, S35, Smart Handgrip, Extension Unit

FS7 II November 2016

Lever Lock E-mount, S35, Electronic Variable ND, Improved Handgrip and EVF

a7R IV July 2019

Auto Focus Algorithms, Full-Frame. E-mount

VENICE in September 2017

Color Science, Full-Frame, Dual Base ISO, E-mount and PL, Top of the Line

FX9 September 2019

PXW-FX9

- New Full-Frame 19MP CMOS 6K Sensor
- E-mount (18mm FFD and 46.1 mm Inside Diameter)
- XAVC Intra/Long, MPEG HD422 Internal Recording
- XQD cards in 2 slots
- Fast Hybrid AF
- Daul base ISO: 800 and 4000
- S-Log3 gamma and S-Gamut3, S-Gamut3.Cine color space
- S-Cinetone color science
- 15+ stops of dynamic range
- 1x 12 SDI output
- Filmic look, VENICE-like color science
- Electronic Variable ND filter
- 4K 4:2:2 10-bit internal recording
- 16-bit RAW output with Extension Unit

PXW-FX9 Body only: $10,999
XDCA-FX9 Extension Unit $2,499
PXW-FX9K Kit with SELP28135G 28-135mm $13,499
Available Jan 2020

Sony PXW-FX9

Switchable ND Filter Control:
Auto, Manual, Clear, Presets, Variable.
Dial for Electronic Variable ND:
1/4ND (2 stops) - 1/128ND (7 stops)
equivalent to ND.6 - ND2.1

START/STOP

Multi Function Dial

4x Audio Controls

2x XQD Media Bays

FE PZ 28-135 mm f/4 G
OSS Full-Frame Zoom

Power ON/OFF

Switchable Auto/Manual ISO, WHT
BAL, SHUTTER, IRIS, FOCUS.
LED glows when set to Auto

Image Plane

Lever Lock E-Mount

VIEWFINDER

12G SDI OUT

3G SDI OUT 2

TIMECODE IN/OUT

GENLOCK IN/OUT

HDMI OUT

Multi function handgrip
electronic connector

XLR Audio Inputs x2

Zoom Control

REMOTE connector

New, slimmer multi
function handgrip

Dial assignable
to Variable ND
or Iris control

Sony FX9

The camera is modular. The basic body weighs a mere 2 kg (4.4 lb).

Add top handle. LCD Viewfinder, and one of hundreds of E-mount lenses. This one is the new FE C 16-35mm T3.1 G. FE means Full-Frame E-mount. C stands for Cine Lens.

Here's the FX9 with Sony FE 70-200mm f/2.8 GM OSS Lens. GM stands for G Master, the pinnacle of Sony lens performance. The FX9 autofocus works with all E-mount lenses enabled with electronic functions.

And this is the Sony G Master FE 135mm f/1.8 GM on the FX9.

Media bay for 2x XQD cards and one SD card

New 14.4V BP-U high capacity batteries slide into the rear compartment

Sony FX9

New 1280x720 LCD Montor/Viewfinder

19.5 V DC EXT IN

Looks familiar: this is the E-mount you see when removing the PL mount from the front of a SONY VENICE.

Using E-mount adapters, including PL to E, you can use almost any lens in the world.

The Sony FX9 excels at ergonomics and economics. It is comfortable and affordable.

Here's one camera body that shoots both Full-Frame and Super35 in a package roughly the size and weight and shape of its Super35 predecessor FS7 II. This defies the myth that Full-Frame cameras have to be 1.5 to 2 times larger and heavier than Super35.

The 19 Megapixel sensor is an all-new design. In Full-Frame, note that the "aperture" is 35.7mm wide x 18.8mm high. (Sony VEN-ICE is 36.2 x 24.1mm). This is a 1.89:1 aspect ratio, compared to the VENICE's 1.5:1 aspect ratio.

I guess the reason the FX9 does not use the full 24mm height is processing power. The greater the picture height, the more work a sensor and processor have to perform. Perhaps full height Full-Frame will be achieved with future hardware or firmware updates.

FX9 inherits very fast hybrid phase-dection and contrast Auto Focus from the latest a7 and a9 camera series. Artificial intelligence keeps focus sharp in Face Priority AF, Face Only AF and Face Registration (multiple faces).

Takuro Ema, Sony Product Planner had a vivid expression to describe the FX9's Autofocus. He called it, rightly: "tenacious persistent focus tracking."

Sony FX9 Full-Frame compared to FS7 II Super35

FX9

Weight: (body only): 2.0 kg 4.4 lb)
Dimensions (body only): 146mm wide
142.5mm high
229mm long
Voltage: 19.5 V DC
Power : 35 W
Battery: New Sony BP-U35 (supplied), BP-U70, BP-U100
14.4 V DC Battery slides into rear of camera

FS7 II

Weight: (body only) 2.0 kg (4 lb 6.5 oz)
Dimensions: (body only) 158.9 mm / 6 3/8" wide
245.2 mm / 9 3/4 high
247 mm / 9 3/4 long
Voltage: 12 V DC (11 V to 16.5 V)
Power : 19 W (body, lens, XAVC-I QFHD 59.94P, viewfinder on)
Battery: Sony BP-U30 (supplied), BP-U60, BP-U60T, or BP-U90

Sony FX9 Ergonomics

280x720 LCD Montor mounts forward or aft and rotates 360°

LCD Monitor/EVF slides in and out from the camera left side, letting you view with right or left eye

LCD Monitor

LCD Monitor with sunshade

LCD Monitor with Viewfinder attachement that has an adjustable diopter. The Viewfinder is hinged and flip up hinged, flips up

Full-Frame & S35 Sensor Modes

6064 total

6008 FF effective

4096 (S35)

4040 total

3168 FF effective

2160 (S35)

24.3mm

12.8mm

18.8mm

35.7mm
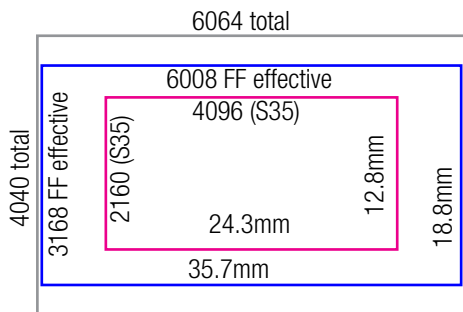
Full-Frame 6008 x 3168 and Super35 4096 x 2160 sensor modes

*Note: Full-Frame 4096 x 2160 and S35 4096 x 2160 recording will be available with a future firmware update.

Sony FX9 with XDCA-FX9 Extension Unit

XDCA-FX9 Extension Unit (optional) at the rear of the camera adds:
- 16-bit RAW output (future update, limited to 10-bit at 120fps S35.
- V-Mount Battery plate
- Ethernet RJ-45 I/F connector
- D-tap power connector
- Dual Link Outputs for streaming
- DWX slots (x2) for wireless audio units

Sony FX9

Recording Formats, Sampling, Bit Depth, Resolution, FPS, Bitrates

Codec	Color Sampling	Bit Depth	Recording Resolution	Frame Rate	Maximum Bitrate
XAVC Intra	4:2:2	10bit	3840x2160	59.94P	600Mbps
				50P	500Mbps
				29.97P	300Mbps
				25P	250Mbps
				23.98P	240Mbps
	4:2:2	10bit	1920x1080	59.94P	222Mbps
				50P	223Mbps
				59.94i	111Mbps
				50i	112Mbps
				29.97P	111Mbps
				25P	112Mbps
				23.98P	89Mbps
XAVC long	4:2:0	8bit	3840x2160	59.94P, 50P	150Mbps
				29.97P, 25P, 23.98P	100Mbps
	4:2:2	10bit	1920x1080	59.94P, 50P	50Mbps
				59.94i, 50i	
				29.97P, 25P, 23.98P	
	4:2:2	10bit	1920x1080	59.94P, 50P	35Mbps
				59.94i, 50i	35Mbps
				29.97P, 25P, 23.98P	35Mbps
	4:2:2	10bit	1920x1080	59.94i, 50i	25Mbps
MPEG HD422	4:2:2	8bit	1920x1080	59.94i, 50i, 29.97P, 25P, 23.98P	50Mbps

Firmware Updates announced, dates not confirmed as of this printing: Full-Frame 4096 x 2160 and S35 4096 x 2160 24p/25p/30p; 4K 60p in Full-Frame, DCI 4K recording mode, 16-bit RAW from XDCA-FX9 Extension unit.

Sony F EC 16-35mm T3.1 G Cinema Lens

Just as the FX9 was inevitable, so were more Sony E-mount cinema lenses. Of course, also work wonders on the alpha series.

The new FE C 16-35mm T3.1 G zoom is the first in a new series of Full-Frame zooms. (Note: Sony's Full-Frame FE PZ 28-135 mm f/4 G OSS Full-Frame Zoom came out with the FS7 in September 2014.)

The new 16-35mm T3.1 G has two XA (Extreme Aspherical) and three Aspheric elements to minimize color aberrations, geometric distortion, field curvature and astigmatism as well as to reduce the physical size of the lens. The floating focus mechanism addresses critical focus and resolution for cinema use. Optical surfaces are coated with Nano AR to reduce flares and ghosting. The 11-bladed circular aperture irs assembly maintains round bokeh at all apertures.

Focus, iris and zoom gears are all standard 0.8M. Slide the focus ring aft to engage manual focus and 120° rotation of the barrel. Slide it forward for Auto Focus. Engraved focus marks remain consistent.

The iris clicks and declicks for cine or still work.

Zoom is switchable from manual to servo. The servo unit comes with the lens and is operated by the camera handle or handgrip zoom control. The servo can be detached.

The Sony FE C 16-35mm T3.1 G zoom lens will be available around Spring 2020. Estimated price is $5,500.

Mount	Sony E-mount
Format	full frame
Focal Length	16-35mm
Lens Groups / Elements	13 / 16
Maximum aperture	T3.1 (F2.8)
Minimum Aperture	T24 (F22)
Aperture Blades	11 (Circular iris blades)
Minimum Focus Distance (m)	0.28
Minimum Focus Distance (ft)	0.92
Maximum Magnification ratio	0.19x
Image stabilization	SteadyShot internally integrated
Zoom system	Both manual and servo

Sony FX9 at 8,000 feet in Granby, Colorado

Cinematographer Meg Kettell with prototype FX9 and prototype 16-35mm G Cinema Lens.

BTS Cinematographer Robert W. Scribner on location with prototype FX9 on Easyrig with Cinema Flex vest.

Cinematographer Meg Kettell tests Fast Hybrid Auto Focus function on low-flying roosters with FX9 prototype.

Cinematographer Meg Kettell on location with prototype FX9 and FE 200-600mm f/5.6-6.3 G OSS long zoom lens.

Product Manager Takahiro Kagawa, from Sony's Atsugi facility, consults with Cinematographer Meg Kettell during the FX9 test shoot in Colorado.

Market Development Manager Laura Pursley, from Sony's Los Angeles team, discusses the FX9 test shoot with Cinematographer Meg Kettell from New York.

Farm Life was filmed with Sony FX9 on and around Sisu Farms - a high altitude ranch in Granby, Colorado.
  Photos by Melissa Thompson, Courtesy of Sony Electronics Inc.
  Cinematographer: Meg Kettell
  1st AC: Ines Portugal
  2nd AC: Josh Klein
  2nd Unit DP: Robert W. Scribner
  Unit Stills Photographer: Melissa Thompson
  Data Manager: Ben Ramirez
  Gaffer: John Murphy

PA: Stephen Steinbacher
Producer: Aila Holley
Executive Producer: Laura Pursley
Technical Consultants:
Takahiro Kagawa
Katsuya Sakoyama
Ryutaro Kuga
Shahpour Nosrati
Sam Fares

SmallHD Cine7 RED Camera Control

SmallHD is announcing the new **Camera Control for RED DSMC2** software license on their popular Cine7 touchscreen monitors.

This software gives users full menu access to a RED DSMC2 camera when the monitor is connected using an included custom cable. With just a simple swipe across the screen, a menu appears as an overlay with offerings of multiple options to dial-in configurations for the camera.

In addition to standard parameters like white balance, resolution and filename, the new license also provides deep-level menu control—including output overlays, image parameter modifications and power settings.

SmallHD's Cine7 camera control came out first for ARRI cameras. They now are ready for RED.

Sony, Canon and Panasonic camera control are next.

So, the Cine7 Monitor is shaping up to be an essential on-set tool for camera crews around the world.

See SmallHD in Vitec Groups's IBC booth: 12.E65

smallhd.com

Small4K

13"

24"

SmallHD announces two lines of new 4K HDR monitors. The name is "Small4K." There will be a **Small4K Vision** Series and a **Small4K Cine** Series, each featuring three monitor sizes: 13", 17", and 24".

Small4K is an appropriately fine name for obvious reasons and these monitors are a welcome addition for critically viewing images on set. All of the Vision and Cine Series monitors will be housed in an elegantly designed, milled-aluminum chassis with a versatile assortment of all the power and video interfaces that the most demanding DIT or DP could desire—including four separate 12G-SDI inputs with loop-out. These 4K monitors, when combined with the Bolt 4K MAX (see next column), will surely drive the adoption of 4K monitoring on set and on location.

The first monitors to be launched will be the Small4K Cine Series. These 4K screens expand the Cine Series lineup that began with the SmallHD Cine7 on-board monitor featuring touchscreen camera control. The Cine Series monitors are fully-featured, with a thorough assortment of power, video and data communication ports. They have beautiful and bright screens displaying rich color and sharp detail. And as with any SmallHD monitor, the Cine Series monitors feature an intuitive software user interface with **curated workflows** for productive production.

The ultra-accurate Small4K Vision Series features everything available on the Cine Series, but raises the bar even further for 4K HDR viewing on set. The Vision Series monitors are reference-grade displays with over 2000 zones of Full-Array Local Dimming and a 1,000,000:1 contrast ratio. These displays cover 114% of the DCI-P3 color space, are fully calibratable, and offer exposure tools for precise and accurate control in HDR cinematography.

So, if you have been shooting in 4K HDR, color-grading in 4K HDR, and watching 4K HDR shows at home on your HDR TV, the nice folks at SmallHD believe it's high-time filmmakers finally start monitoring in 4K HDR with their 4K HDR sets on their sets.

Teradek Bolt 4K MAX

Teradek Bolt 4K MAX 12G-SDI, HDMI Wireless TX-RX
(Transmitter-Receiver with Gold Mount Battery Plate

New for IBC from Creative Solutions is the **Teradek Bolt 4K MAX**. Joining the Bolt 4K 750 and Bolt 4K 1500 that were announced earlier this year, the fully-loaded Bolt 4K MAX is the most feature-rich Bolt transmitter Teradek ever made. Bolt 4K MAX can transmit 4K HDR video wirelessly—in real-time—over distances up to 5000 ft (1500 m) in normal operation and up to 10,000 ft (3000 m) in Broadcast Mode.

Living up to the maximum potential in its name, Bolt 4K MAX is packed full of new options, including the ability to:

- up-convert or down-convert resolutions being output from each individual receiver (as needed),
- transmit to unlimited receivers in Broadcast Mode
- improve the system's performance in congested areas with the option of a Fixed Frequency Mode.

The striking sharpness and gorgeous color fidelity transmitted by the Bolt 4K devices are a leap up from previous models—a revelation even when transmitting video from MAX in HD.

Improved sharpness of the new 4K MAX is sure to please **focus pullers straining their eyes** looking at monitors being fed by earlier technology.

The free iOS and Android Bolt 4K app makes configuring and pairing the devices a quick and easy via Bluetooth.

Panasonic LUMIX DC-S1H Full-Frame 6K

Yosuke Yamane, Director of Panasonic's Imaging Network Business Division

The Panasonic Lumix DC-S1H was first revealed at the start of Cine Gear on May 31, 2019. Three months later, August 27, the full details were announced.

The S1H is a Full-Frame, 36mm x 24mm sensor, 24p, 6K 10-bit video camera "hiding" in the body of a DSLM. The shape makes it great as a grab camera, handheld, on rigs, gimbals, drones, or fully outfitted with a studio rig. This is the camera when you want to capture video and not look like a filmmaker but rather a street photographer.

Panasonic now provides 3 Full-Frame L-Mount LUMIX S Series Digital Single Lens Mirrorless cameras: S1R (47.3 MP), S1 (24.2MP) and now the S1H (24.2 MP, 6K video). Think of the "R" model as "Resolution" and the "H" as in High Performance, High-End and Hybrid. The S1H is color-matched to the rest of the Panasonic VariCam line. It has a dynamic range of more than 14 stops.

This sentence had the audience applauding: "Panasonic is proud to present a new Full-Frame mirrorless camera, the LUMIX S1H, with 6K/24p (3:2) recording capability."

Panasonic's Matt Frazer describes the S1H as "a camera that speaks three languages: still, video and filmmaking."

Let's begin with its compelling capabilities for filmmaking since the S1H has also been called a DSLM (Digital Single Lens Mirrorless) approaching "A" camera image quality.

The new 24.2-megapixel Full-Frame CMOS sensor (35.6mm x 23.8mm) has an active image area of 6,024 x 4,016 photosites. It has an OLPF (Optical Low Pass Filter.)

The S1H has Dual-Native ISO which will be familiar, along with the concept of shot noise, to VariCam and EVA1 users. You can switch from LOW ISO 640 to HIGH ISO 4000 with imperceptible changes in noise or picture quality. Further adjustments within each range offer (LOW) ISO 640-5000 and (HIGH) ISO 4000-51200 sensitivities.

The S1H offers 6K Full-Frame 4:2:0 10-bit, 4K Full-Frame 4:2:2 10-bit, and 4K Super35 4:2:0 10-bit internal video recording (among many other choices.) An HDMI Type A connector outputs 4:2:2 10-bit 4K 60p/50p and, just announced, 5.9K 30p and 4K 60p RAW.

You can shoot high speed up to 60 fps in 4K and 180 fps in Full HD. Helpfully, audio can be recorded even in high speed modes.

Designers and engineers from the Panasonic VariCam team con-tributed to the S1H development. This is evident in the color science, 14 stops of dynamic range and V-Log/V-Gamut.

Time Code IN/OUT connects with a special BNC to flash synchro terminal cable. So, you can jam-sync the S1H with VariCam cameras and audio recorders on set.

In-Camera Body I.S. (5-axis sensor stabilization) working together with O.I.S. (2-axis in-lens stabilization) can make handheld shots look like they were done on a tripod. It works in both still and video modes. If you're using non-stabilized cine lenses (and most are not stabilized) with a L-Mount adapter, the 5-axis Body I.S. will still compensate for shake and camera movement.

The S1H can shoot video non-stop. This was confirmed with pre-production models even in the desert. Panasonic installed a small cooling fan behind the sensor towards the rear of the camera's rugged die-cast magnesium alloy body. The fan is very quiet, dust and splash resistant, and keeps things cool for almost unlimited shooting—until you have to reload SD cards, battery, or the AD calls "Lunch One Hour."

The 7.4-V 3050 mAh onboard battery runs the camera for about 2 hours. It can be quick-charged (and you can keep shooting) with the included USB3.1 PD (USB Power Delivery) Type-C cable. This is the same cable to be used for high-speed data transfer from camera to computer.

There are two SD Memory Card slots, with a choice of Relay Recording (after one card fills up, records to next one), Backup Recording (files cloned on second card) or Allocation Recording (e.g. video and photo files on separate cards).

Viewing

Panasonic calls the EVF an LVF (Live View Finder) and it is a gorgeous 5.76 million-dot OLED display that pushes the boundaries of what was previously viewable. The LVF is switchable between 60 fps and 120 fps for jitter-free viewing. Latency is almost zero (.005 sec) and contrast approaches 10,000:1. You can switch the finder magnification ratio from 0.78x to 0.7x or 0.74x.

The 3.2-inch, 2.33 million-dot touch screen (touch shutter, touch AF) rear monitor has dual hinges for all kinds of viewing permutations. It tilts up and down in the usual way and also swings out to the left, up and down to avoid interfering with cables and connections.

Panasonic S1H Full-Frame 6K

The Status LCD on top of the camera is large (1.8-inch), high resolution, and switchable with backlight for black or white text. MIP (Memory In Pixel) technology ensures that the display is always visible, even when camera power is off. Critical values for still or video are shown, including recording time remaining, battery status, ISO, shutter speed, aperture, white balance, etc.

Oh, and yes, the S1H is still a high performance still camera.

Of course, the LUMIX S1H also shoots stellar stills up to 6000x4000 JPEG and 14-bit RAW. The High Resolution mode approaches Medium Format quality by shooting 8 consecutive pictures while shifting the sensor half a pixel for each frame. The Body I.S. mechanism evens out any shake and a 96-megapixel equivalent (12,000 x 8,000-pixel) image is processed inside the S1H. This could be excellent for shooting background plates, art work or pictures destined for massive enlargement.

Panasonic's Contrast AF with DFD (Depth from Defocus) technology gets the shot in focus within 0.08 seconds. Face and eye detection works in both still and video modes, locking in and following an eye—whether human, animal, cat, dog or bird. Advanced Artificial Intelligence Technology keeps the shot in continuous focus even when someone or some critter turns away from camera.

The S1H camera body will be available for $3999.99 at the end of September.

Accessories

- Microphone Adaptor (DMW-XLR1),
- Remote Shutter (DMW-RS2),
- Eyecup (DMW-EC6),
- Battery Grip (DMW-BGS1),
- Battery Charger (DMW-BTC14) and more.

Summary

Panasonic, SIGMA and Leica are partners in the L-Mount Alliance. The L-Mount has a flange focal depth of 20mm and an inside diameter of 51.6 mm. You can attach PL, LPL, PV and other lenses by using mechanical adapters.

The L-Mount system diversifies choices since Panasonic, Sigma and Leica all share this mount system. You can mix and match cameras and lenses and lens mount adapters. (L-Mount is a registered trademark of Leica Camera AG.)

At the launch, Panasonic announced that more than 46 interchangeable L-Mount lenses will be available by the end of 2020, including 11 or more LUMIX S/S PRO lenses from Panasonic, 17 from Sigma and 18 from Leica. One of these L-Mount LUMIX lenses was announced concurrently with the new camera:

LUMIX S PRO 24-70mm F2.8

The LUMIX S PRO 24-70mm F2.8 (S-E2470) is a high resolution and high contrast lens with an 82mm front filter thread, 11-blade circular iris and beautiful bokeh. Breathing is minimal.

There are 18 lens elements in 16 groups, three aspherical lenses and four ED (Extra-low Dispersion) lenses. A UHR (Ultra-High Refractive Index) element ensures uniform image quality from the center to the edges while keeping the physical size of the lens to a minimum. The focus system combines linear and stepping motors for fast, precise AF. The focus clutch mechanism switches from AF to MF (manual focusing).

The LUMIX S PRO 24-70mm lens will be available in October for $2199.99.

At left: S1H cooling system. Above: LUMIX S PRO 24-70mm F2.8.

Discussion with Panasonic S1H Design & Engineering Teams

Satoshi Horie, product leader of LUMIX S1H

Masanori Koyama (Product Planning)

The S1H announcement at Cine Gear on May 20 was a like a teaser. Being greedy, I wanted to learn more from members of the S1H team. Here is edited text of discussions with Satoshi Horie (Product Leader of LUMIX S1H), Masanori Koyama (Product Planning) and Takahiro Mitsui (VariCam Team Leader).

JON FAUER: When did you begin work on the S1H concept?

PANASONIC: We began to consider the Full-Frame concept beginning 8 years ago, but we created S1H concept in 2017, at the same time as the S1R and S1.

Please take us through the process of designing the camera. Do you begin with a "wish list" of specifications and then decide on the shape of the camera body?

When a new camera development is started, a wish list is created based on the customer's requests and the survey results of the trend function. However, the shape of the body is not decided afterwards. At the same time as the discussion to determine the target specifications based on the wish list, the product concept is discussed to determine the direction of the body shape. The product concept is discussed based on what kind of unique values of Panasonic should be offered to what kind of customers. The camera shape is decided to maximize the benefits offered with the product.

I guess you have a large team working on camera design? Electronic, mechanical, sensor, styling, etc?

We would rather not get into specific numbers of people, but each project of a product consists of about 10 to 15 leaders of development elements. One project consists of core element development teams such as product design, electrical circuit design, exterior mechanical design, image stabilization, lens mount, mechanical shutter, image quality design, and software design. Each leader has their own development unit team, but some members are participating in projects that develop in parallel. Overall, more than 100 staff are involved in the development of S1H.

Did you conduct research to see whether customers were interested in Full-Frame (24x36mm) compared to Micro Four Thirds? Do you see a shift in the market from MFT and APS-C to Full-Frame?

Although we have never done research on choices between the two, we have received many requests from GH5 users for a Full-Frame version. Many of the needs were for users who were shooting handheld or with gimbals, and who wanted to shoot in Full-Frame image quality with the codecs of the GH5. The S1H

addresses these requests from all directions.

Do you see the same shift to Full-Frame in the cinema market?

There are increasing demands for Full-Frame systems as a whole camera market and therefore there must be a considerable impact on demand for MFTS and APS-C systems. However, smaller sensor system such as MFTS and APS-C have advantages thanks to its size. For example, high-speed reading, high frame rate for move, easy-to-handle depth of field, and size as a whole system. There is definitely a demand for these.

The demand for those merits should be even stronger in the video market, especially in the film production such as cinema. This is because the merits of the Full-Frame sensor such as shallow depth of field, resolution, and high sensitivity are only a part of the image representation and situations which require the advantages of MFTS and Super35mm / APS-C sensors continue to exist.

It is assumed that demand for small sensors will remain firm as MFTS and APS-C size cameras are used in combination while the Full-Frame demand will increase to some extent.

Would you like to tell us more about the sensor?

It is a 24.2MP Full-Frame sensor with Optical LPF with Dual Native ISO (Base ISO is 640 and 4000 in V-Log)

How is unlimited video recording time possible? How did you avoid overheating?

We have employed a heat-dispersing design via a fan structure. (This is an industry first for a Full-Frame Digital Single Lens Mirrorless Camera as of August 27th, 2019.)

Can you tell us more about the L-Mount? Does the short 20mm Flange Focal Depth have advantages for lens designers?

Yes, compared to a DSLR, it is easier to design a mirrorless lens for compactness and resolution. The reason is that for the same focal length lens, there is less space in a DSLR lens for allocation of the optical elements when the flange back is longer. It therefore results in more power to each lens element which then has a risk of aberrations and results in less resolution. Furthermore, if the mount diameters are the same, it is easier to design high speed lenses and wide angle lenses for mirrorless cameras.

Where do you go from here?

We have many more features we would like to introduce.

Videos shot with the S1H are available to view online: panasonic.com/global/consumer/lumix/s/s1h.html

Panasonic LUMIX DC-S1H Views

Tally Indicator

Timecode IN/OUT, Flash Synchro

Full-Frame (35.6mm x 23.8mm) CMOS sensor 24.2 MP 6024 x 4016 photosites

Connectors on this side:

Remote
MIC
Headphones
USB-C (3.1)
HDMI

Lens Release

Video Start/Stop

Front Dial

Shutter (Stills)

Camera ON/OFF/ Status LCD Backlight

Mode Dial

White Balance
ISO
Exposure Compensation

Image Plane

Video Start/Stop

Status LCD

Rear dial

S1H Highlights

- 10-bit 4K 60p
- Unlimited recording time.
- 6K 24p (3:2) video in Full-Frame
- 10-bit C4K/4K 60p/50p video
- (C4K = 4K DCI. 4K = UHD 4K)
- 4:2:2 10-bit internal and HDMI output
- 5.9K 30p and 4K 60p RAW external recording from HDMI output
- Image Stabilization (6-stop Body IS effective with cine lenses. 6.5-stop equivalent Dual IS2 when using native LUMIX S lens.)
- Anamorphic desqueeze view (1.30x, 1.33x, 1.5x, 1.8x or 2.0x)
- High frame rate recording with AF and audio recording
- Variable frame rate from 2 fps to 180 fps
- 4K 60p/50p time lapse video
- HLG video/photo

Drive Mode   Lock Lever   Playback   Rear Tally   Focus Mode   AF Mode

AF ON (Auto Focus)

Joystick

Q Quick Menu

2 SD Card slots inside

Control Dial

Menu/Set

Cancel/Return

SD Card "busy"

EVF/Monitor Display Options

Delete

Panasonic LUMIX DC-S1H Specs

Partial List of Specifications

Type	Digital Single Lens Mirrorless camera
Recording media	SD Memory Card / SDHC Memory Card / SDXC Memory Card
Lens mount	L-Mount
Type	Full-Frame (35.6mm x 23.8mm) CMOS sensor
Camera effective pixels / Total pixels	24.20 megapixels — 6024 x 4016 photosites / 25.28 megapixels
Aspect ratios (stills)	4:3 / 3:2 / 16:9 / 1:1 / 65:24 / 2:1
Still image files	RAW / RAW+Fine JPG / RAW+Standard JPG/ Fine JPG/ Standard JPG
Motion Picture File Formats	• MOV: H.264/MPEG-4 AVC, H.265/HEVC • MP4: H.264/MPEG-4 AVC, H.265/HEVC • AVCHD Progressive, AVCHD
[6K] 5952x3968 (3:2) Full-Frame	• 23.98p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable.
[5.4K] 5376x3584 (3:2) Full-Frame	• 29.97p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable.
[5.9K] 5888x3312 Full-Frame	• 29.97p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable. • 23.98p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable.
[Cinema 4K] 4096x2160 Full-Frame	• 29.97p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable. • 23.98p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable.
[4K UHD] 3840x2160 Full-Frame	• 29.97p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable. • 23.98p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable.
[Cinema 4K] 4096x2160 Super35	• 59.94p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable. • 59.94p, 150Mbps (4:2:0 8-bit LongGOP, H.264/MPEG-4 AVC) • 47.95p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable. • 29.97p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable. • 23.98p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable.
[4K UD UHD] 3840x2160	• 59.94p, 200Mbps (4:2:0 10-bit LongGOP) (H.265/HEVC) HLG is selectable. • 59.94p, 150Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) • 47.95p, 200Mbps (4:2:0 10-bit LongGOP) (H.265/HEVC) HLG is selectable. • 29.97p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable. • 23.98p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable.
[Anamorphic 4K] 3328x2496 (4:3) S35	• 47.95p, 200Mbps (4:2:0 10-bit LongGOP, H.265/HEVC) HLG is selectable. • 29.97p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable. • 23.98p, 400Mbps (4:2:2 10-bit ALL-Intra) / 150Mbps (4:2:2 10-bit LongGOP) / 100Mbps (4:2:0 8-bit LongGOP) (H.264/MPEG-4 AVC) HLG is selectable.
Viewfinder	OLED Live Viewfinder Approx. 5.76 million dots, 120fps / 60fps, time lag approx. 0.005 sec.
Monitor	TFT LCD touch-screen monitor, Dual hinge, 3.2-inch (8.0cm), 3:2 aspect, Approx. 2.33 million dots
HDMI Type A full-size connector	• S1H will be able to output 5.9K 30p and Cinema 4K 60p as RAW data via HDMI • 4:2:2 10-bit — When [Rec Quality] is set to [4:2:2 10-bit] or [4:2:0 10-bit]. • 4:2:2 8-bit — When [Rec Quality] is set to [4:2:0 8-bit]. • Down Convert: Auto / 4K/30p/25p / 1080p / 1080i / OFF • HLG View Assist (HDMI): AUTO / MODE1 / MODE2 / OFF (selectable)
USB	SuperSpeed USB 3.1 Gen1 Type-C

Design and specifications are subject to change without notice.

Atomos RAW over HDMI from Lumix S1H

At IBC 2019, Atomos and Panasonic announce 35mm Full-Frame RAW video over HDMI from the Lumix S1H to Ninja V. This is from the original press release, edited slightly in the interest of clarity and FDTimes style:

Atomos worked with Panasonic to co-develop recording RAW files on the Atomos Ninja V 4K HDR monitor-recorder via HDMI from the new Lumix S1H. The RAW update will be available free on the Ninja V when the software update on the camera is released by Panasonic.

Jeromy Young, Atomos CEO, said, "We are very proud of continuing to develop new ground-breaking technology with a company of the caliber of Panasonic. We are both highly committed to the democratisation of filmmaking for creators. The ability to transmit RAW over HDMI from the S1H to a Ninja V is a major leap forward in this endeavour."

The Lumix S1H is the new Full-Frame mirrorless camera capable of 6K internal video. It combines the qualities of a cine camera with a still camera, and squeezing all that into the size of a digital interchangeable-lens mirrorless camera, making it an excellent companion with the Ninja V.

At their launch event in LA, Panasonic representatives said, "One of the leading brands of external monitor-recorders is definitely Atomos. Both companies have a very good relationship and we have been providing 4:2:2 10-bit HDMI output recording for the Lumix GH series for years. We are very proud to be developing RAW output via HDMI with Atomos for the S1H."

Jeromy Young added, "Our advancements in screen technology now allow creators to accurately monitor RAW video in real-time as it would be viewed in the home or cinema—with the original creative intent preserved. Our pristine custom Atomos HDR screens are excellent in color accuracy and representation of brightness from RAW signals. When combined, these advantages create a dream workflow for filmmakers."

Breaking News

And then this landed, an update in the hours before IBC, under embargo until after Panasonic and Atomos press conferences at 10:30pm Amsterdam time:

Panasonic S1H will be able to output 5.9K 30p and C4K 60p as RAW data via HDMI.

ATOMOS Ninja V and Shogun 7 will be able to record Apple ProRes RAW from the S1H HDMI output. ATOMOS Neon 17, 24, 31 and 55-inch Monitor/Recorders will as well.

S1H RAW Recording from HDMI to ATOMOS products is planned to be released around Spring 2020.

The new Panasonic Lumix S1H will be shown working with the Atomos Ninja V at IBC in Amsterdam beginning September 13 at Atomos's booth 11.D25. More information will be available during the show.

A working demonstration will also be shown at Panasonic's IBC 2019 booth 11C45. How convenient. The two companies are next to each other.

Atomos Shogun 7
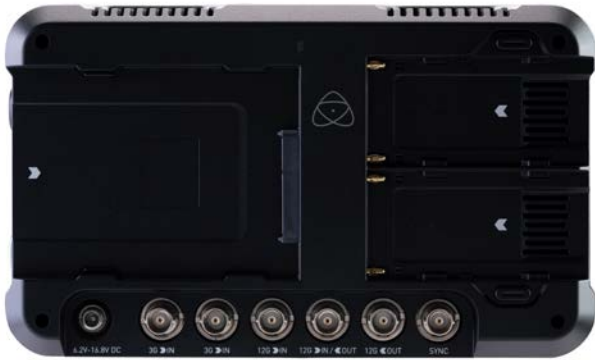
On the previous page, we learned that Panasonic's new S1H will output RAW video to not only an Atomos Ninja V but also an Atomos Shogun 7.

Here are more details on the Atomos Shogun 7. It is a 7-inch, HDR, Dolby Vision monitor-recorder. It's also a switcher if you're doing multi-camera setups or television.

Shogun 7 has something pretty much for everyone on set.

- For the cinematographer and camera operator, it is a stand-alone onboard monitor.
- If you're a focus puller/camera assistant, it's a sharp, bright monitor that also records internally so you can play back a take independently to check for critical focus.
- Grips can mount the Shogun 7 on the dolly push-bar to anticipate action in real-time.
- The sound mixer and boom operator can check framing to keep the mic out of the shot.
- The Script supervisor, wardrobe, hair and makeup departments can each check continuity on their individual Shogun 7 monitors.

But probably the most persuasive reason to get a Shogun 7 is the ability to record 4K from so many cameras, including Nikon, Canon, Panasonic, Sony, RED and ARRI. Shogun 7 is part of Atomos's growing list of monitor/recorders that are very adept at recording RAW files at resolutions and rates that the original camera itself does not manage internally. The Panasonic S1H is just the latest example.

Shogun 7 records and plays back ProRes RAW, ProRes,

CinemaDNG (up to 30p) and Avid DNxHD via HDMI and SDI.

Shogun 7 records 4K up to 60p via HDMI 2.0, Quad Link, Dual Link or Single Link BNC connectors. For slow motion, it records 2K up to 240p.

Atomos and Dolby teamed up to provide Dolby Vision HDR playback in real-time via the Shogun 7's HDMI connector. So, when you connect a Dolby Vision capable TV or monitor to the Shogun 7's HDMI output, built-in AtomOS software analyzes the image, determines which TV or monitor is connected, and applies the right color and brightness profiles for the HDR picture displayed.

Specs in Brief

- Weight without batteries and media: 709 g / 25 oz.
- Dimensions: 214 x 127 45 mm (W x H x D)
- Operating power: 10 - 33W
- Input voltage: 6.2V to 16.8V
- Onboard batteries: Atomos NP-F series
- Battery time: (Monitor & record 4K 30p) up to 1.5 hrs with 2 x 7.4V 5200 mAh batts; up to 2.2 hrs with 2 x 7.4V 7800 mAh batts
- Touchscreen: 7.2" 1920 x 1280, 325 PPI, 16:9 Aspect ratio
- Look up table (LUT) support: 3D LUT (.cube format)
- Anamorphic de-squeeze: 2x, 1.5x, 1.33x
- Brightness: 1500 nits (+/- 10%)
- Mounting points: 1/4"-20 screw mount. 1x top and 1x bottom
- Supported base resolution & fps from cameras:

4K DCI:	23.98/29.9/59.94p
4K UHD:	23.98/29.9/59.94p
2K DCI:	23.98/29.9/59.94p
1080p:	23.98/29.9/59.94p

IDX IPL Series Stackable Batteries

The IPL Series is the latest stackable battery system from IDX, creators of PowerLink (piggy-backing) batteries. While previous generations allowed only two batteries to be linked, the new PowerLink technology can link up to four batteries together. This considerably extends continuous shooting times by drawing power from the last battery mounted, and then moving forward.

With 96Wh and 143Wh capacities, the IPL-98 and IPL-150 are both travel-friendly and capable of up to 14A when linked. The last battery mounted can be another IDX brand V-Mount battery, which allows users to create a capacity fitted to their needs. With the right battery combination, it is possible to get up to 715Wh.

IPL-150 and IPL-98

The new PowerLink technology also takes charging into consideration. When using the VL-2000S charger, up to four IDX batteries can be stacked on each port while two batteries charge simultaneously. That's a total of 8 batteries that can be left unattended as charging commences with the furthest battery from each port.

The IPL batteries come equipped with all of IDX's latest technologies, including BMS (battery management system), SMBus, D-Tap Advanced, D-Tap, and a USB output to power additional items. A standard V-Torch LED light makes the IPL batteries easy to mount in dark studios or night exterior locations. Accurate power levels are displayed in 10% increments via a 5-LED power indicator.

For more information, go to: *idxtek.com/powerlink*

Stacked together

Dual Charger

Blackmagic Pocket Cinema Camera 6K

Blackmagic Pocket Cinema Camera 6K

Blackmagic Design's new Blackmagic Pocket Cinema Camera 6K is highly capable Super35 cinema camera "hiding" in a DSLM body (Digital Single Lens Mirrorless). There are many things to like. For many, it is the new, larger, 6144 x 3456 Super35 sensor. The effective image area is 23.10mm x 12.99mm. It has an EF lens mount.

How does the Blackmagic Pocket Cinema Camera 6K compare to the Pocket Cinema Camera 4K? The 4K model, shown below, was introduced last year. It has a Micro Four Thirds (MFT) size 18.96 x 10 mm sensor. The MFT lens mount's Flange Focal Depth is 19.25mm and its inside diameter is 21.64 mm Ø.

Blackmagic Pocket Cinema Camera 4K

The original Pocket Cinema Camera was introduced in 2013. Shown below, it also has an MFT lens mount. Its sensor is 1920x1080 HD, 16mm motion picture format size size (7.02 x 12.48 mm). By comparison, an Arriflex 16SR3 gate is 7.5 x 12.5 mm.

The original Blackmagic Pocket Cinema Camera

The EF lens mount of the Blackmagic Pocket Cinema Camera 6K will be applauded by the hundreds of millions of Canon, ZEISS, SIGMA and Schneider EF lens owners worldwide. Almost any EF lens on the planet will fit the Pocket Cinema Camera 6K's industry-standard 44mm Flange Focal Depth and 54mm inside diameter EF lens mount.

There is a significant difference in look between Super35 and MFT format sensors. Super35 has a shallower depth of field that renders pleasingly softer backgrounds and bigger bokeh.

The new 6K model records onto internal CFast 2.0 cards and SD cards up to 50 fps at 6144 x 3456 16:9, up to 60 fps at 6144 x 2560 2.4:1, or up to 60 fps at 5744 x 3024 17:9. You can shoot with S35 anamorphic lenses with a windowed 6:5 sensor area of 3.7K 3728 x 3104 up to 60 fps. For higher frame rates, you can go up to 120 fps in 2.8K 2868 x 1512 17:9.

The camera records industry-standard 10-bit Apple ProRes files in all formats up to 4K or 12-bit Blackmagic RAW in all formats up to 6K. Media files are compatible with all operating systems. You can format media cards and disks in HFS+ for Mac and ExFAT for Windows.

Files are recorded to internal, removable CFast and SD UHS-II media cards. You can use regular SD cards for HD. Higher performance UHS-II and CFast cards are required for native 4K or 6K when using Blackmagic RAW. A USB-C connector enables recording directly to an external hard drive, such as an SSD.

Blackmagic RAW is a new format. It is somewhat like a film camera negative, preserving the original sensor data. The files are nimble and small. Blackmagic RAW avoids the noise, artifacts and baked-in looks of highly compressed formats such as H.264. Blackmagic RAW saves camera settings as metadata. This ensures that while you can set ISO, white balance and exposure in camera, you can also override and adjust these settings in post. DaVinci Resolve Studio, which comes free with the 4K and 6K models, has great tools for working with Blackmagic RAW files.

The rear of the Blackmagic Pocket Cinema Camera 6K, like the 4K model, has a large, bright 5-inch touchscreen. Touch to focus. It also displays camera settings and menus. Display overlays show status, histogram, focus and peaking indicators, audio levels, frame guides, playback controls and more. Tap and swipe gestures navigate the intuitive screens to adjust settings, add metadata and view recording status. Advanced camera features provide access

Blackmagic Pocket Cinema Camera 6K

Press each of these buttons to adjust with Settings Dial:

Function Buttons

Power ON - OFF

Speaker

1/4-20

WB: White Balance

SHUTTER

ISO

STILL photo capture

RECORD Start - Stop

Settings DIAL, Push to Set

Tally (Recording)

Built-in Mics

to focus and exposure tools, 3D LUTs, HDR, metadata entry, timecode, Blackmagic RAW settings and more.

The Pocket Cinema Camera 6K works with industry standard 17 and 33 point 3D LUT files, or you can use the camera's built-in LUTs such as Extended Video, Film to Video, Film to Rec.2020 and more.

Here's one of the best explanations of LUTS, directly from Blackmagic Design: "Digital cine cameras can shoot logarithmic colorspace (LOG) to preserve dynamic range, which is great for later post production. However when these files are viewed with an on-set monitor or in-camera, they can look flat and washed out. 3D LUTs solve this problem because they apply a "look" to the monitor so you get an idea of how the finished images will look in post-production."

The Blackmagic Pocket Cinema Camera 6K can be jam-synced by an external source, such as an audio recorder, Denecke or Ambient timecode slate, Lockit or Tentacle Sync device. Plug the external timecode source into the camera's 3.5 mm audio jack. The camera will detect timecode and lock its "clock." Multiple Blackmagic Pocket Cinema Cameras are popular for car shots, action sequences, stunts, and music videos. We've seen dozens of them shooting simultaneously. Timecode syncs them all together, and they maintain sync with the same matched timecode after many start-stops.

By the way, the new DaVinci Resolve 16.1 can automatically find and sync shots from all cameras in a multiple camera setup. This saves an enormous amount of time. Blackmagic Pocket Cinema Camera 6K (and 4K) includes a full version of DaVinci Resolve Studio.

Blackmagic Pocket Cinema Camera 6K Main Features

- Carbon fiber polycarbonate composite construction.
- Multifunction handgrip controls start/stop, ISO, WB and shutter angle.
- 6K 6144 x 3456.
- EF lens mount.
- 13 stops of dynamic range.
- Dual ISO of 400 and 3200. Selectable to 25,600.
- Records full resolution up to 60 fps or 120 fps windowed.
- SD, UHS-II and CFast internal media slots.
- 5" LCD touchscreen.
- Blackmagic OS as used in URSA Mini and URSA Broadcast cameras.
- Full size HDMI connector for HDR and 10-bit output.
- Mini XLR audio input with 48 volt phantom power.
- 3D LUTs can be applied for both monitoring and recording.
- USB-C port to record directly to external SSD.
- Timecode generator.
- Still frame capture up to 21.2 megapixel.
- Remote camera control via Bluetooth.
- Onboard LP-E6 7.2V Battery. Recharge via USB-C.
- 12V DC ext. power connector.
- Includes full DaVinci Resolve Studio.

Availability and Price

Blackmagic Pocket Cinema Camera 6K is available now at US $2,495, excluding duties, from Blackmagic Design resellers worldwide.

Blackmagic Pocket Cinema Camera 6K

3.5mm Mic or Line Audio Input. Also Timecode IN for jam-syncing.

3.5mm Headphone Output

Full-size HDMI Output: for Monitoring with or without text and 10-bit External Recording

USB-C connector (up to 5 Gb/sec for recording to external drives. Also to recharge battery and update software.

Mini 3-pin XLR Mic Input

External 12-20 V DC Power Input and Battery Charger

FRAME RATE

SHUTTER ANGLE

IRIS. You can also toggle Auto Iris ON and OFF here.

TIMECODE Hrs: Mins: Secs: Frames

ISO

WHITE BALANCE

TINT Green-Magenta

BATTERY Status

IRIS: push for auto exposure with auto enabled lenses

FOCUS: push for focus with auto enabled lenses

HFR: toggles between High Frame Rate and project's normal fps

ZOOM in to check focus

MEDIA Card Cover: slide back to open

MENU

PLAYBACK

Touch to Autofocus on any specific area of the screen (with EF autofocus enabled lenses)

Touch to RECORD Start-Stop

MEDIA Card status. Touch for details and to FORMAT

Blackmagic Pocket Cinema Camera 6K Specs

Effective Sensor Size:	23.10mm x 12.99mm (Super 35)
Lens Mount:	Active EF mount.
Lens Control:	Iris, focus and zoom on supported lenses.
Dynamic Range:	13 Stops.
Dual Native ISO:	400 and 3200. 25,600 highest
Shooting Resolutions & Frame Rates	6144 x 3456 (6K) up to 50 fps 6144 x 2560 (6K 2.4:1) up to 60 fps 5744 x 3024 (5.7K 17:9) up to 60 fps 4096 x 2160 (4K DCI) up to 60 fps 3840 x 2160 (Ultra HD) up to 60 fps 3728 x 3104 (3.7K 6:5 anamorphic) up to 60 fps 2868 x 1512 (2.8K 17:9) up to 120 fps 1920 x 1080 (HD) up to 120 fps
Project frame rates	23.98, 24, 25, 29.97, 30, 50, 59.94 and 60 fps supported
Frame Rates	Maximum sensor frame rate dependent on resolution and codec selected. Off-speed frame rates up to 60 fps in 6K 2.4:1, 120 fps in 2.8K 17:9 and 1080HD.
Video Standards	**4K DCI** 4KDCIp23.98, 4KDCIp24, 4KDCIp25, 4KDCIp29.97, 4KDCIp30, 4KDCIp50, 4KDCIp59.94, 4KDCIp60. **Ultra HD** 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30, 2160p50, 2160p59.94, 2160p60. **HD Video** 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60.
Focus	Auto focus available using compatible lenses.
Iris Control	Iris wheel and touchscreen slider for manual iris adjustment on electronically controllable lenses, iris button for instant auto iris settings on compatible lenses.
Screen	5" 1920 x 1080. LCD capacitive touchscreen.
Metadata Support	Automatically populated lens data from electronic EF lenses. Automatic recording of camera settings and slate data such as project, scene number, take and special notes. A 3D LUT can also be embedded in metadata of Blackmagic RAW files.
Controls	Touchscreen menus on 5 inch screen. 1 x Power Switch, 1 x Record Button, 1 x Stills Button, 1 x Scroll Wheel with push integrated into handgrip, 1 x ISO, Button, 1 x White Balance, 1 x Shutter Button, 3 x software configurable Fn buttons, 1 x High Frame Rate (HFR) Button, 1 x Zoom Button, 1 x Menu Button, 1 x Play Button, 1 x Focus Button and 1 x IRIS Button.
Video Output	HDMI Type A
Connection Port	USB Type-C for external drive recording and software updates
Audio Output	1 x 3.5mm headphone jack

Audio Input	1 x mini XLR analog switchable between mic with phantom power support and line level (up to +14dBu). 1 x 3.5mm Stereo Input. Can also be used for Timecode input.
EXT Power IN	2-pin locking connector
Media	1 x CFast 2.0 card. 1 x SD UHS-II card.
Recording Formats	Blackmagic RAW 3:1, 5:1, 8:1, 12:1, Q0 and Q5 at 6144 x 3456, 6144 x 2560, 5744 x 3024, 3728 x 3104 and 2868 x 1512 with film, extended video, video dynamic range or custom 3D LUT embedded in metadata. ProRes at 4096 x 2160, 3840 x 2160 and 1920 x 1080 with film, extended video or video dynamic range or custom 3D LUT.
Codecs	Blackmagic RAW Constant Bitrate 3:1, Blackmagic RAW Constant Bitrate 5:1, Blackmagic RAW Constant Bitrate 8:1, Blackmagic RAW Constant Bitrate 12:1, Blackmagic RAW Constant Quality Q0, Blackmagic RAW Constant Quality Q5, ProRes 422 HQ QuickTime, ProRes 422 QuickTime, ProRes 422 LT QuickTime, ProRes 422 Proxy QuickTime
6K 16:9 6144 x 3456 Data Rates	Blackmagic RAW 3:1 - 323 MB/s Blackmagic RAW 5:1 - 194 MB/s Blackmagic RAW 8:1 - 121 MB/s Blackmagic RAW 12:1 - 81 MB/s Blackmagic RAW Q0 ~194 to 483 MB/s Blackmagic RAW Q5 ~49 to 139 MB/s
6K 2.41 6144 x 2560 Data Rates	Blackmagic RAW 3:1 - 240 MB/s Blackmagic RAW 5:1 - 144 MB/s Blackmagic RAW 8:1 - 90 MB/s Blackmagic RAW 12:1 - 60 MB/s Blackmagic RAW Q0 ~ 144 to 359 MB/ s Blackmagic RAW Q5 ~ 37 to 103 MB/s
5.7K 17:9 5744 x 3024 Data Rates	Blackmagic RAW 3:1 - 264 MB/s Blackmagic RAW 5:1 - 159 MB/s Blackmagic RAW 8:1 - 100 MB/s Blackmagic RAW 12:1 - 67 MB/s Blackmagic RAW Q0 ~ 159 to 395 MB/ s Blackmagic RAW Q5 ~ 40 to 114 MB/s
4K DCI 4096 x 2160 Data Rates	Apple ProRes 422 HQ - 117.88 MB/s Apple ProRes 422 - 78.63 MB/s Apple ProRes 422 LT - 54.63 MB/s Apple ProRes Proxy - 24.25 MB/s
Battery	Canon LP-E6 Battery 7.2V 1865mAh approx 45 minutes run-time (recording 6K RAW at 24 fps to CFast 2.0 with screen brightness at 50%)
Ext. Power	12V-20V DC.
Dimensions	7"W x 3.8"H x 4" D
Weight	1.98 lb

Kazuto Yamaki, SIGMA CEO

SIGMA Classic Cine Art Prime 20mm T2.5.

On July 11, 2019, SIGMA CEO Kazuto Yamaki announced a plethora of new products in Tokyo at the Spiral Art Center. There were new still photography lenses, new cine lenses and a new camera. The launch event has been covered in the August edition of FDTimes.

Here is a follow-up discussion.

SIGMA Style

JON FAUER: How did you pick the Spiral location?

KAZUTO YAMAKI: We considered several potential locations at first and then picked Spiral because we wanted to have the event in a unique and sophisticated place. We found that Spiral was the best choice. It has style. Also, the area, Omotesando, has always been my favorite place since I was a teenager.

Someone said, "Photography is like fashion."

Fashion may not be the correct terminology because it is always about a matter of trends. Having said that, photography sometimes has such an aspect. I would prefer to call it "style," and not "fashion," for both the still photography and cine worlds.

Classic Art Prime Lenses

How did you decide to make Classic Art Primes? Who asked?

Almost everyone: rental houses, pro dealers and Cinematographers were making requests. They asked for lenses that recalled the atmosphere of classic films produced in the 50s, 60s and 70s. Therefore, SIGMA is releasing a new series of 10 Full-Frame cine lenses with modern mechanics and optical specifications that produce a vintage look.

How did you decide on the amount of flare and how "vintage" the Classic Art Primes should look?

We made several prototypes and had some Cinematographers try them. We picked the ones they liked the most. To replicate the look of historic lenses, we have used many uncoated elements.

Some glass elements in the lenses have a simple, single-layer coating that provides a warm color tone reproduction, which is one of the characteristics of vintage lenses.

Are the coatings old formulas used in the 1970s or other eras?

Not exactly. We use a simple single coating like the one used in 70s, but we use new formulas and new coating materials.

Why do the Classics stop down to T25 (when they show T22 on the aperture scale and the FF High Speed lenses stop down to T16) ?

Due to the lower transmission factors, the original smallest T value of 16 becomes T25. But we print T22 as the minimum aperture on the lens.

Delivery and cost?

We start delivery at the end of 2019. The price is approximately 15% higher than the original FF High Speed versions. The cost is higher because of the smaller production volume.

What trends do you see in the coming years for vintage vs modern lenses?

We assume the demand for these kinds of special lenses are limited to special customers, but we strongly believe that this classic series of lenses give DPs more options for wider cinematic expressions.

SIGMA fp

When did the SIGMA fp Full-Frame L-Mount camera project begin?

I got the idea at the end of 2016. Then, we started the project in the first half of 2017.

You called it "deconstructing a digital camera?" What inspired that concept?

I'm always monitoring how professionals and enthusiasts

Kazuto Yamaki, SIGMA CEO

use cameras. And, I became aware that they often use several different cameras depending on the occasion. For example, still photographers sometimes use a cinema camera, professional people use a smartphone or action cam, etc. Then, I thought it would be nice if we deconstructed the essence of each type of digital camera.

When will delivery and prices be announced?

We're still studying the price. Once the development is done, we will decide. We start delivery this fall.

This camera has features (12-bit RAW internal video recording, tiny size) that no one else has done. How was this possible?

Our electronic and firmware engineers did a great job. The powerful DSP (Digital Signal Processor) also contributes to it.

How has the building of cameras evolved?

The processors have been playing an important role in camera manufacturing. And when it comes to serious cinema cameras, it's getting more and more important. However, mechanical build quality and thermal management are also very important.

Is SIGMA planning grips and accessories for the fp camera?

Yes, we are working on it. We plan to sell 2 types of grips, but I also hope other accessory companies will make additional things that fit the fp.

SIGMA L-Mount and E-mount Lenses

Please explain what you said about short flange focal depth helping lens designers.

It makes the optical design for wide angle lenses much easier. The shorter flange focal distance gives manufacturers a wider range of options for techniques used in the lens design. In many cases, it helps to achieve better optical performance as well.

Did you say there might be 15 additional SIGMA L-mount lenses coming by the end of 2020?

More than that. We already announced that we are making our existing 14 mirrorless lenses available in L-Mount. They are currently available only in Sony E-mount and Micro Four Thirds mount. In addition to that, we have developed brand new lenses. On July 11, we announced 3 new lenses for L-Mount. Moving forward, we will continuously release new L-Mount lenses.

Why did you decide to include the Sony E-mount in your new lens roadmap?

Because there are so many customers and the demand is so strong.

But not Canon RF and Nikon Z mirrorless lens mounts?

We're still studying those new systems.

Future Concepts

Do you see growth in independent cine production?

I believe so. The young generation is interested in making films and benefitting from the new technologies that support the art.

Is the high-end in cinema production growing or is it giving way to more affordable products?

I assume that the high-end continues to grow, especially in new

SIGMA fp Full-Frame, 24.6 megapixel L-Mount camera

markets and countries where we didn't see much of that kind of production before.

Do you see the L-Mount becoming popular for cine cameras?

Yes, I hope so because the L-Mount has ideal parameters for cine. We need to work hard to attract cine customers to the L-Mount.

Looking into a crystal ball, without revealing specific ongoing projects, do customers request more SIGMA FF cine zooms?

Yes, we have such requests every day.

Where does SIGMA go from here?

We will strive to deliver more innovative, higher quality and higher performing products.

SIGMA boutique shops in major cities?

It's one of my dreams. If there's a chance…

What are your plans to build the SIGMA brand?

Making SIGMA the best brand in the imaging industry is my passion and my life-time goal.

I have 3 visions on becoming the best brand:

1. To be a company that continues to create the most innovative products with the highest performance, quality and dignity in the imaging (photo/video/cinema) industry.

2. To become the most reliable and beloved brand.

3. In terms of corporate culture, growth and creativity are motivated and one's strength is fully expected. We are aiming to be an energetic company driven by a free spirit that encourages every single employee to take responsibility and challenge the status quo.

We can't be a gigantic company like Canon or Sony. We can't create the great history like Leica or ARRI. However, with our all efforts, we can strive to be the most valuable brand for our users, business clients, community and all the employees. This may not be achieved during my lifetime, but by keeping such a vision and continuously working hard, we may be able to get closer to that point.

SIGMA Full-Frame Classic Art Primes

SIGMA launched their splendidly small, sharp, lightweight and affordable FF High Speed Primes at IBC 2016. Now, three years later, SIGMA adds a new series: Full-Frame Classic Art Primes. A prototype 40mm was presented in Tokyo on July 11. Two months later, the set is here in Amsterdam at IBC 2019.

The SIGMA Full-Frame Classic Art Primes are controllable, classic, flarey, vintage-looking lenses reminiscent of Hollywood's Golden Era. Picture the glowing highlights and smooth skin tones on Garbo, Bacall and Dietrich. These primes are mostly uncoated inside, and single-coated on the outside front and rear element surfaces.

Because uncoated optical elements reduce the amount light transmission, SIGMA Classics are slower than the FF High Speed series. So, SIGMA FF High Speed Primes with a T1.5 maximum aperture become Classics at T2.5. T2 FF High Speed Primes become T3.2. The last stop engraved on the barrel is T22, although technically it goes further to T25.

Which series do you choose? The SIGMA FF High Speed Primes offer extremely high resolution and pristine images. The Full-Frame Classic Art Primes are based on the FF High Speed series. They retain the high resolution of the FF series and then go further to achieve a classic vintage look with the addition of uncoated optical elements and a combination of low contrast, artistic flaring and ghosting of the image. A special coating is used on the front and rear elements to protect them from those other elements outside the lens: spray, salt, dust, dirt, fingerprints. As with all the lenses in the FF High Speed Prime series, the Classic Art Primes create beautiful bokeh.

The FF Classic Art Primes have consistent maximum apertures of T2.5, except the 14mm and 135mm which are T3.2.

Cooke /i Technology lens metadata is incorporated and communicated to cameras via 4 standard contacts in the PL lens mount.

Delivery is planned around the end of the year. Only sold as a set of 10 primes.

Prices TBD, but expected to be about 15% more than the FF High Speeds (which are around $3499 for most of the standard versions and $4499 for the fully luminous, numbers that glow in the dark, models.) The 14, 105 and 135 mm are $4999 each ($5999 luminous).

Only available in PL mount. SIGMA Mount Conversion Service for the FF Classic Art Primes is not available.

PL mount with typical four /i Technology contacts at the 12 o'clock position

SIGMA Full-Frame Classic Art Primes

Framegrabs from "Operator" — short film shot with SIGMA Full-Frame Classic Art Primes. Directed by Bhavani Lee.
Cinematography by Timur Civan.   Choreographer and Dancer: Bhavani Lee.   Steadicam Operator: Jason Leeds.
Focus Puller: Ryan Patrick O'Hara.   Camera: RED MONSTRO 8K VV.   On YouTube: youtu.be/bQgRf8fW_no
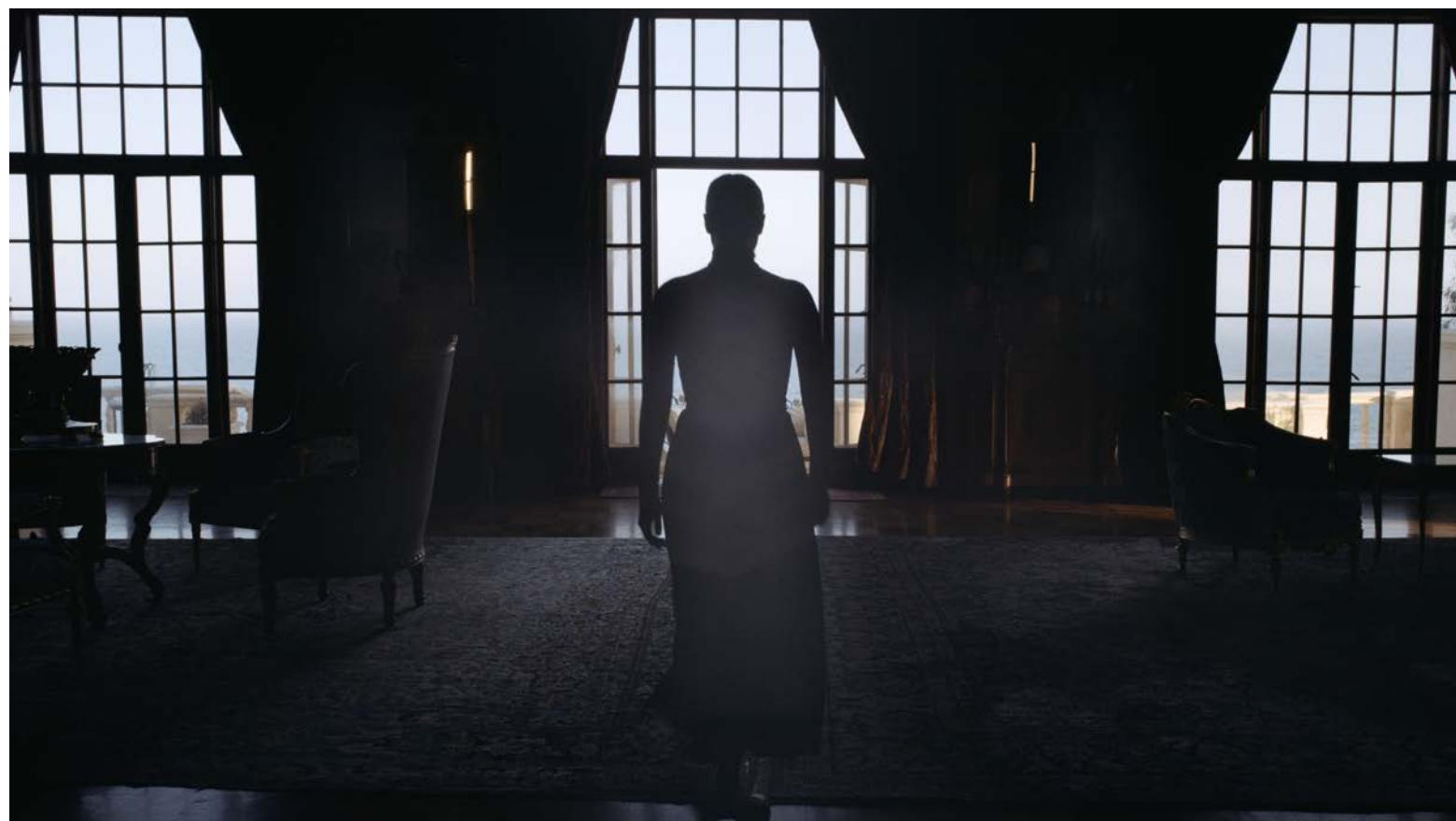
SIGMA Full-Frame Classic Art Primes

Cinematographer Timur Civan said, "I shot with the 35mm and 50mm prototypes. Most of the time, we stopped down quite a bit to help control flare shape and amount, mostly from T4 - T11. As far as impressions, it seems that SIGMA started with an extremely clean, precise, sharp lens and introduced 'controlled chaos.' They stripped out the perfect behavior to allow the Classics and Cinematographers go wild."

FF Classic Prime	Focal length	Aperture (T)	Close focus[1]	Front Diameter	Filter Thread	Length[2]	Weight[3]
14mm T3.2 FF	14mm	T3.2 – T25	0.27m / 11"	95mm	–	111.5mm	TBD
20mm T2.5 FF	20mm	T2.5 – T25	0.276m / 11"	95mm	–	110.0mm	TBD
24mm T2.5 FF	24mm	T2.5 – T25	0.25m / 10"	95mm	82mm	87.0mm	TBD
28mm T2.5 FF	28mm	T2.5 – T25	0.30m / 1'	95mm	82mm	99.7mm	TBD
35mm T2.5 FF	35mm	T2.5 – T25	0.30m / 1'	95mm	82mm	87mm	TBD
40mm T2.5 FF	40mm	T2.5 – T25	0.40m / 1'4"	95mm	82mm	123.0mm	TBD
50mm T2.5 FF	50mm	T2.5 – T25	0.40m / 1'4"	95mm	82mm	94.0mm	TBD
85mm T2.5 FF	85mm	T2.5 – T25	0.85m / 2'10"	95mm	86mm	118.9mm	TBD
105mm T2.5 FF	105mm	T2.5 – T25	1.00m / 3'4"	95mm	–	126.2mm	TBD
135mm T3.2 FF	135mm	T3.2 – T25	0.875m / 2'11"	95mm	82mm	106.9mm	TBD

[1] Close focus distance is measured from the image plane.
[2] Length measured from front of lens to PL mount flange.
[3] Weight measured without lens support foot.

SIGMA Full-Frame Classic Art Primes come standard in PL mount with /i Technology lens data contacts.

Image Circle: 43.3mm Ø. Image illumination: greater than 46.3mm Ø.

Iris blades: 9 (rounded diaphragm)

SIGMA FF High Speed Cine Lens Art Primes

SIGMA presents the new Art Prime version of the popular FF High Speed Prime Series. These lenses have PL mounts that are equipped with /i Technology lens metadata communication protocol and electronic contacts.

Claudio Miranda ASC used prototypes of these /i Technology equipped FF High Speed Prime lenses on *Top Gun: Maverick*, scheduled to be released in 2020.

SIGMA is considering a conversion service for customers who already purchased SIGMA PL mount lenses and would like to add /i Technology to their lenses.

Lens	Aperture	Close Focus [1]	Front Diameter	Filter Thread	Length			Weight [5]		
					EF mount[2]	E-mount[3]	PL[4]	EF mount	E-mount	PL
14mm T2 FF	T2 - 16	0.27m / 11"	95mm	-	119.5mm	145.5mm	111.5mm	1430g	1485g	1345g
20mm T1.5 FF	T1.5 - 16	0.27m / 11"	95mm	-	118mm	144mm	110mm	1335g	1395g	1240g
24mm T1.5 FF	T1.5 - 16	0.25m / 10"	95mm	82mm	95mm	121mm	87mm	1125g	1185g	1030g
28mm T1.5 FF	T1.5 - 16	0.30m / 1'	95mm	82mm	107.7mm	133.7mm	99.7mm	1,300g	1,360g	1,210g
35mm T1.5 FF	T1.5 - 16	0.30m / 1'	95mm	82mm	95mm	121mm	87mm	1135g	1165g	1035g
40mm T1.5 FF	T1.5 - 16	0.40m / 1'4"	95mm	82mm	131mm	157mm	123mm	1560g	1620g	1470g
50mm T1.5 FF	T1.5 - 16	0.40m / 1'4"	95mm	82mm	102mm	128mm	94mm	1295g	1355g	1210g
85mm T1.5 FF	T1.5 - 16	0.85m / 2'10"	95mm	86mm	134.5mm	160.5mm	126.5mm	1475g	1535g	1380g
105mm T1.5 FF	T1.5 - 16	1.00m / 3'4"	95mm	-	134.2mm	160.2mm	126.2mm	1775g	1835g	1705g
135mm T2 FF	T2 - 16	0.875m 2'11"	95mm	82mm	126.4mm	152.4mm	118.4mm	1565g	1630g	1495g

1. Close focus distance is measured from the image plane
2. Front to EF mount flange
3. Front to E-mount flange
4. Front to PL mount flange
5. Without lens support foot

Number of iris blades: 9 (rounded diaphragm)
Image Circle: 43.3mm Ø diagonal.
Image illumination: greater than 46.3mm Ø diagonal.
Available in EF (Canon), E-mount (Sony), and PL mounts.

Specifications are subject to change.

SIGMA PL to L-Mount Converter

Quick review: The L-Mount Alliance consists of SIGMA, Panasonic and Leica. The L-Mount has a 20mm FFD and 51.6 mm ID. Full-Frame L-Mount cameras include Leica SL, Panasonic S1, S1R, S1H and SIGMA fp.

(By the way, by way of comparison, the Sony E-mount has an 18mm FFD and 46.1 mm ID.)

So, how do you attach a PL mount lens to an L-Mount camera?

The latest adapter to attach PL mount lenses on L-Mount cameras is the SIGMA Mount Converter MC-31.

Construction

The MC-31 has an aluminum-alloy body with a strong brass mount and locking ring. The markings on the upper part of the converter use the same luminous paint as used on SIGMA cine lenses, making them easier to read in the dark.

If you're using the MC-31 on the SIGMA fp camera (shown below), an additional screw thread ensures an even more secure connection between the adapter and the camera.

The reason is that the L-Mount is not a breech lock like the PL mount, and this extra screw keeps the adapter tight and secure from twisting even after long-term use.

Shims

The MC-31 has shims to adjust Flange Focal Depth on both the front and on the back side of the adapter. You can shim on the L-mount side (camera side) with the included shim kit, or on the PL side (lens side) of the adapter using standard ARRI ALEXA PL mount shims. This is unique for any mount adapter as far as I know, and it's a really good idea.

Tripod and Lens Support

A removable support bracket with 1/4-20 threads lets you attach the MC-31 to a tripod, handgrip, camera cage or .

PL Lock

Most PL mount breech locks have a stopper to prevent over-tightening. But sometimes the PL tabs of a lens can be too thin and the lens wobbles because you can't tighten the mount past the stopper pin. The MC-31 has an adjustment to release the stopper pin so can tighten the breech lock further. Of course, be careful you don't tighten to the point of not being able to loosen it again.

SIGMA fp as Director's Viewfinder (and PL mount Cine Camera)

FF High Speed Prime with PL mount

MC-31 PL to L-Mount Adapter

SIGMA fp Full-Frame camera

LVF-11 LCD Viewfinder with diopter

SIGMA fp 14-bit RAW Still Camera & 12-bit RAW Cine Camera

The *fp* part of the name *SIGMA fp* is an abbreviation of *fortissimo* and *pianissimo*.

Fortissimo in music means "to be played very loudly." *Pianissimo* means "to be played very softly." You can "play" the SIGMA fp camera very "loudly" on major cine productions. Or you can play it "softly" as a pocketable, compact camera for daily use.

SIGMA calls their fp the world's smallest and lightest Full-Frame Mirrorless digital camera (as of today). It has a 35.9mm×23.9mm Full-Frame 24.6MP sensor in a compact body of great versatility and scalability that allows mixing-and-matching a panoply of interchangeable lenses and accessories.

This is a camera that is casual enough to take anywhere, anytime, even in your pocket. It is also quite capable of serious still and cine shooting at the highest image quality, all in a robust and stylish body.

SIGMA CEO Kazuto Yamaki said at the fp camera's launch that the aim was to deconstruct the traditional digital camera. In re-constructing the SIGMA fp, there are five unique features.

First, it is Pocketable Full-Frame camera.

Second, it is Seamless. SIGMA's intention was to disrupt the hierarchy established by manufacturers' camera-centric categories. The new fp breaks the boundaries between still and cine cameras.

With the SIGMA fp bridging the gap between still and cine camera, a slide switch takes you seamlessly between modes. Video UHD/4K 12-bit CinemaDNG RAW files can be recorded at 24 fps as well as UHD/4K 24, 25 10-bit and 30 fps 8-bit H.264.

Third, it is Scalable. Because the fp is so small, compact and lightweight, it is a camera that is comfortable even when shooting hours on end, to be used on a gimbal or drone, on a Steadicam or stabilizer, tripod or handheld, with handgrip, mattebox or sunshade.

Whether working on a large crew or alone, the SIGMA fp's versatile 20mm FFD mirrorless mount accepts scores of lenses from the SIGMA, Panasonic and Leica L-Mount alliance. Or you can attach the PL to L-Mount adapter for access to a world of PL cine lenses.

Fourth, the SIGMA fp supports CinemaDNG internal and external RAW recording, including 4K/UHD 24fps 12-bit.

Fifth, the fp has a Director's Finder mode. Attach the LCD Viewfinder/Diopter accessory to compose shots with framelines calibrated for various aspect ratios on (thus far) ALEXA LF, Mini LF, ALEXA 65, Venice, Monstro 8K, Helium 8K, Dragon 6K, Epic MX 5K, Gemini 5K, Arricam, ALEXA SXT, XT, Mini, Amira, etc.

SIGMA is among the elite group of companies who design and build cameras, lenses and software—with great skill and style.

SIGMA fp Full-Frame Camera

SIGMA fp	DSLM — Digital Single Lens (Interchangeable) Mirrorless Camera
Image Sensor	Full-Frame 35.9mm×23.9mm Back-illuminated Bayer CMOS sensor RGB Primary color filter array
Pixels	Effective: Approx. 24.6MP (6,072×4,056) / Total: Approx. 25.38MP (6,104×4,142)
Storage Media	SD/SDHC/SDXC memory card(UHS-II supported) / External SSD (USB 3.0 connection, USB bus power supported)
Lens Mount	L-Mount — 20mm Flange Focal Depth 51.6mm ID ∅
Video Recording Formats	Internal: CinemaDNG RAW 8-bit / 10-bit / 12-bit / MOV: H.264 (ALL-I / GOP)
Resolution / Frame Rates	3840×2160 (UHD 4K) / 8-bit 23.98p, 25p, 29.97p (4:2:0 in-camera; 4:2:2 via HDMI output)
	1,920×1,080 (FHD) / 8-bit 23.98p, 25p, 29.97p, 59.94p, 100p, 119.88p (4:2:0 in-camera; 4:2:2 via HDMI output)
HDMI Output	External recorders supported: ATOMOS Ninja Inferno Ninja V and Shogun 7; Blackmagic Video Assist 4K. ATOMOS Open Protocol Support: allows user to start or stop recording of an external recorder.
Timecode	Recorded internally or output via HDMI. In Cine mode, Free Run or Record Run timecode is supported, with a choice of Drop Frame and Non Drop Frame.
Live Streaming	Connect fp camera to a computer via the USB C port for Full-Framevideo and audio webcam streaming.
Audio Format	Linear PCM (2ch 48kHz /16bit)
Still Image File Formats	Lossless compression RAW (DNG) 12-bit / 14-bit, JPEG (Exif2.3), RAW (DNG)+JPEG — sRGB / Adobe RGB
Still Image Aspect Ratios	[21:9] / [16:9] / [3:2] / [A Size ($\sqrt{2}$:1)] / [4:3] / [7:6] / [1:1]
Some Still Image File Sizes	RAW HIGH 6,000×4,000 LOW 3,008×2,000
	JPEG [3:2] HIGH 6,000×4,000 MED 4,240×2,832 LOW 3,008×2,000
Focus	Contrast detection system, Single AF, Continuous AF (with moving object prediction function), Manual Focus
Metering System	Evaluative, Spot, Center Weighted Average Control
Still Image Shooting Modes	(P) Program AE (Program Shift is possible), (S) Shutter Speed Priority AE, (A) Aperture Priority AE, (M) Manual
Video Shooting Modes	(P) Program AE, (S) Shutter Speed Priority AE, (A) Aperture Priority AE, (M) Manual
ISO Sensitivity	ISO 100-25600. Expanded sensitivity ISO 6, 12, 25, 50, 51200, 102400
AE / AF Lock	Half-press the shutter button, or press the AEL button (setting change required)
Image Stabilization System	Electronic system
White Balance	12 types (Auto, Auto (Lighting Source Priority), Daylight, Shade, Overcast, Incandescent, Fluorescent, Color Temperature, Flash, Custom 1, Custom 2, Custom 3)
Shutter / Shutter Speed	Electronic shutter: 30 to 1/8,000 sec. Bulb also displays shutter angle equivalent of shutter speed.
Drive Modes	Single shooting, Continuous shooting, Self-timer, Interval shooting
Continuous shooting speed	HI: 18 fps, MED: 5 fps, LO: 3 fps / Maximum shots = HIGH: 12 frames, MED: 12 frames, LO: 24 frames
Monitor	3.15" TFT color LCD monitor, 3:2 Aspect Ratio, Approx. 2.1M dots / Electrostatic capacitance system touch panel
Interval shooting	Available
Still Shooting Mode Functions	Fill Light / Shading Correction / HDR shooting
CINE Shooting Mode Functions	Still image capture during video shooting / HDR mode / Director's Viewfinder Framelines
Built-in Microphone, Speaker	Stereo microphone, Monaural speaker
USB / HDMI	USB 3.1 Gen 1 Type C / HDMI Type D (Ver.1.4)
Release Terminal	Also used as an external microphone terminal.
External Microphone	Available (Plug-in power support)
Power	Li-ion Battery BP-51 USB power supply available (when the power is turned off)
Dimensions	112.6×69.9×45.3mm
Weight	422g (including battery and SD card), 370g (Camera Body Only)
Included Accessories	LI-ION Battery BP-51, USB AC Adapter UAC-11, USB Cable (A-C) SUC-11, HOT SHOE UNIT HU-11.
Optional Accessories	HAND GRIP HG-11, LARGE HAND GRIP HG-21, LCD VIEW FINDER LVF-11, BASE PLATE BPL-11, CABLE RELEASE CR-41, BASE GRIP BG-11, DC CONNECTOR CN-21, BATTERY CHARGER BC-71, AC ADAPTER SAC-7P, ELECTRONIC FLASH EF-630, MOUNT CONVERTER MC-21.
Dimensions	112.6 x 69.9 x 45.3mm
Weight	422g (including battery and SD card), 370g (Camera Body Only)

FUJIFILM GFX100 with PL Mount

This story unfolds like a fairy tale. Once upon a time, not too long ago, May 23, 2019 to be exact, a digital medium format camera was born in the city of Omiya, Japan. He was named FUJIFILM GFX100 and he was beautiful. A month earlier, April 3, a Large Format zoom lens was born to the FUJINON branch of the Fujifilm family. She was named Premista. Cinematographers soon noticed that these children could play nicely together. And so, the good people of ALPA in Switzerland introduced XO and everyone lived happily ever after.

The GFX100 Medium Format mirrorless digital camera has a new 102 megapixel back-side illuminated sensor with in-body image stabilization.

☞ Sensor size: 43.9mm x 32.9mm (55mm Ø diagonal)
☞ RAW still image: 291 MB; 11,648 x 8,736 px. JPEG: 43.3 MB
☞ G mount: 26.7mm Flange Focal Depth, ~65mm mount diameter
☞ ISO: 100-12,800 and 50-25,600
☞ Dimensions: 6.15" (W) x 6.44" (H) x 4.05" (D)
☞ Weight: approx. 3 lb. including two batteries, memory card and EVF
☞ Suggested retail price USD $9,999.95

The FUJIFILM GFX system includes a series of superb FUJINON GF lenses in G Mount:

GF 23 mm F4 R LM WR	GF 45mm F2.8 R WR
GF 50mm F3.5 R LM WR	GF 63mm F2.8 R WR
GF 110mm F2 R LM WR	GF 120mm F4 Macro R LM OIS WR
GF 250mm F4 R LM OIS WR	GF 32-64mm F4 R LM WR zoom

GF 100-200mm F5.6 R LM OIS WR
GF 45-100 F4 R LM OIS WR zoom (planned 2020)

It took only a few milliseconds after camera launch for cinematographers to learn that the GFX100 also possessed advanced video capabilities. So they huffed and they puffed and a PL mount quickly appeared from the nice folks at ALPA in Switzerland.

🎞 The GFX100 records DCI 4K/UHD 4K MOV 4:2:2 10-bit video files at 400 Mbps and 23.98, 24, 25 and 29.97 fps.

🎞 External 4:2:2 10-bit uncompressed video outputs through the HDMI port.

🎞 A PL mount lets you could work with Medium Format cine lenses like Leitz Thalia primes, Alexa 65 lenses and more.

So, lo and behold, you can shoot Medium Format video not only with FUJINON GF series lenses, as outlined at top. You can also attach a Leitz THALIA 24, 30, 35, 45, 55, 70, 100, 120, 180 mm prime, or a THALIA-T, shown above. They all have an image circle of 60mm, which is even greater than the GFX100's 55mm Ø.

Blackwing[7] 37, 47, 57, 77, 107 and 137mm T1.9 primes from Tribe7 cover a 60mm image illumination circle. An LPL mount is planned. This will open up the realm of ARRI ALEXA 65 lenses: Prime 65, Prime 65 S, Prime DNA and more. I would imagine additional mounts will appear. Perhaps Panavision SP70?

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Our fairy tale continues... And then, before you could say Swiss Family Robinson or Swiss Army Knife, a FUJINON Premista Full Frame 28-100mm T2.9 zoom lens was attached to a GFX100 with the Swiss-made ALPA PL mount. It made a fleeting appearance at Cine Gear.

So, a lens intended for Full-Frame happened to cover the entire Fujifilm GFX100 55mm image circle in 16:9 aspect ratio. Was this a happy accident that just happened?

The Premista 28-100mm T2.9 specs in Film and Digital Times say 46.3mm Image Circle. Fake news or did FUJINON engineers anticipate that cinematographers might try covering a larger circle?

And so it came to pass that FUJIFILM's Tom Fletcher and Michael Bulbenko put me in touch with Marko Massinger who delivered his prototype ALPA XO Exoskeleton for the FUJIFILM GFX100 by way of Jeff Hirsch at Fotocare. The XO system relieves the stress of heavy cine lenses on the native G Mount. The XO comes with a PL-Mount. An LPL mount is in development.

Like the princess and a frog transformed, the XO Exoskeleton can turn your FUJIFILM GFX100 into a complete cinematography system. More than two hundred 1/4-20 and more than a dozen 3/8-16 threads let you configure the camera for any situation: handheld, studio, drones, gimbals.

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The XO System transforms the Medium Format GFX100 into a cine camera that can work alongside an ARRI ALEXA 65. You can use it as a "B" camera on stunts and rigs or as the "A" camera itself.

Marko wrote, "I immediately liked the GFX100. It combines the ease of use of a modern DSLM with an incredible viewfinder and the amazing resolution of 102 megapixels only available before in more limited and more expensive medium format cameras.

"Then I noticed the GFX100 capabilities in capturing moving images. Internal 10-bit F-Log recording of UHD 4K and DCI 4K at 400 Mbit/s is really impressive on its own, but even more impressive is the image recording area of the sensor."

Since this has been a tale of magic and wizards, of course it has a happy ending. Hideyuki Kasai, Product Manager at FUJIFILM in Europe, emailed: "Marko Massinger has joined FUJIFILM to support FUJINON Optical Devices Europe GmbH where he will take care of strategy and business development. Marko grew up in Stuttgart, Germany. He has worked as a photographer, director and entrepreneur. In 2016, Marko was appointed as a member of the German Government Center of Excellence for the Cultural and Creative Industries. His extensive knowledge of imaging technology is as highly appreciated in the industry as are his skills as a chef preparing Mediterranean food." Kasai and Massinger know how to get my attention: Orecchiette Burrata, Vitello Tonnato, Lasagna...

FUJIFILM GFX100 and ALPA XO

My photographs of the XO show a silvery aluminum SLM (selective laser melting) prototype. The final XO will be machined from aircraft grade aluminum, with 3- and 5-axis CNC-milling and turning, and then anodized black or storm gray as a special edition.

XO rods are things of beauty, with holes like Swiss cheese.

The rods look like little rockets and are gorgeously machined of lightweight and very strong titanium.

For further information:
xo.alpa.swiss

What does Angénieux know about Primes? Ask Orson Welles. 1958.

Orson Welles, Jeanne Moreau, and Cinematographer Willy Kurant, ASC, AFC off the coast of Yugoslavia on the unfinished film *The Deep* (1966-1969). It was adapted from the 1963 novel *Dead Calm* by Charles Williams. Philip Noyce directed Sam Neil, Nicole Kidman and Billy Zane in the 1989 film version, *Dead Calm*. Photo courtesy Willy Kurant.

"I just want to occupy unoccupied territory and work there."

Angénieux unveiled Optimo Prime Lenses at the Cannes Film Festival on May 23. Twelve Full-Frame lenses are planned. The Optimo Primes match the look and feel of Angénieux's Optimo Zooms. The Optimo Primes can be customized at the factory or by certified lens technicians to achieve unique looks. The iris assembly is removable. An internal element can be swapped, offering different air gaps and coatings. In case anyone wonders what Angenieux knows about primes, Willy Kurant, ASC, AFC talked with Film and Digital Times about working with Orson Welles and the wide angle 18.5 mm Angénieux prime lens:

"In the 1950s, I bought the 18.5 mm Angenieux Retrofocus wide angle prime. I had a hard time mounting it on my Arri 2-B camera. I had to remove the mattebox and other lenses because everything appeared in the shot, even my fingers.

"On my first day of shooting *The Immortal Story* with Orson, I was operating handheld with an 18.5 mm Angénieux on the Éclair CM3, moving from Jeanne Moreau to the candles she was lighting and then blowing them out—with smoke all over.

"This was the first shot Orson saw in dailies. He liked my cinematography and also the 18.5 mm lens, and from that moment on, we had a wonderful collaborative working relationship. Orson had his own CM3 and bought an 18.5 Angénieux lens which we used on *The Deep*, with Jeanne Moreau (again) and Laurence Harvey."

The Angénieux 18.5 mm lens was introduced in 1951. In a 1958 Cahiers du Cinéma interview, Orson Welles talked about shooting with it in the intervening years. What he said sounds familiar today— finding a new lens to define a new look. (Note: the Cooke Speed Panchro Series III 18 mm prime lens was not released until 1954.)

Cahiers du Cinéma: Are you still using the 18.5mm wide lens?

Orson Welles: Yes, almost everything is shot with the 18.5mm in *Touch of Evil (1958)*. There are unsuspected possibilities with this lens...in *Mr. Arkadin (1955)*, not for all the shots, but for the majority. In *Don Quixote (1957)*, everything is with the 18.5mm.

Why do you systematically pursue using the 18.5mm lens?

I work, and have worked, with the 18.5mm lens uniquely because other filmmakers do not use it. The cinema is like a colony but there are very few colonists. When America was opening up, with the Spanish at the Mexican frontier, the French in Canada, the Dutch in New York, one can be sure that the English went to places that were still unoccupied. I do not prefer the 18.5mm lens. I am simply alone in having explored its possibilities...

I occupy places that are unoccupied because, in this young medium of expression, it is a necessity. The first thing we must remember about cinema is its youth. And the essential thing for every responsible artist is to reclaim that which has been left fallow. If everyone worked with wide angle lenses, I would instead shoot all my films with a 75mm lens... If other artists were working in an extremely baroque style, I would be working in a more classical style than you have ever seen. I not act like this from a spirit of contradiction. I do not want to go against what has been done but rather to occupy unoccupied ground and work there.

You have used the 18.5mm lens for a long time. You have already explored a good part of this territory, and yet you persist. Why is there such an affection between you and this lens?

...The 18.5 lens is a new, major invention. It has hardly been five years...and how many people have used it? Each time I give it to a director of photography, he is terrorized: but by the end of the film, it is his favorite lens.

From June 1958 Cahiers du Cinéma, "Entretien avec Orson Welles," by André Bazin and Charles Bitsch. For providing the original text in French, thanks to Laurent Mannoni, Cinémathèque Française, Directeur scientifique du patrimoine et du Conservatoire des techniques and to Laure Parchomenko, Cinémathèque Française, Conservatoire des techniques. Thanks also to Jerome Cuzol, Managing Director of Cahiers du Cinéma for permission to use. Apologies for errors in my translation. The text has been edited in the interest of keeping focus on the 18.5mm lens.

Band Pro tests Angénieux Optimo Primes

Randy Wedick in Venice with VENICE in Rialto mode and Optimo Prime, above. Wheeling a white seamless in Hollywood, below. All production stills by Brett Gillespie.

The talented team of filmmakers, Randy Wedick and Brett Gillespie, whose day jobs are at Band Pro, just finished a short film to showcase the new Angénieux Optimo Primes. What better way to test a new lens than portraits? After all, motion pictures are mostly occupied by actors' faces. So, when Angénieux asked Band Pro to do an Optimo Prime demo film for IBC, they knew it had to be about portraiture. Here is their report, edited into one dual-person singular:

"Our visual reference was Richard Avedon's 1979-1984 series of portraits, *In the American West*. He photographed real people, not actors or models, against a white backdrop.

"Only the Angénieux Optimo Prime 40mm prototype was available when we filmed this August. The camera was a Sony VENICE, mostly in Rialto (extension system) mode. We also worked with VENICE in traditional hand-held configuration. But for most of the three-day shoot, the camera body lived in a nondescript backpack that I carried. It was run-and-gun Rialto tether mode: a cable connected the camera body in my backpack to the camera sensor/lens head that I was holding. We wanted to work as low-key and inconspicuously as possible.

"One thing that was not so inconspicuous was our roll of white seamless, Avedon-style, that we put on stands and rolled around LA. We went to the three neighborhoods in the Los Angeles area where there actually are pedestrians walking around: downtown LA, Hollywood, and Venice beach. Ironically, this demo makes it look like people in LA truly walk. We went to those places, asked people if we could film them, got great portraits, and of course got their releases.

"It was amusing that we could just wander around with this high-end Full-Frame VENICE cinema camera and one of the best lenses in the world—looking like guys with a DSLR making a travel blog.
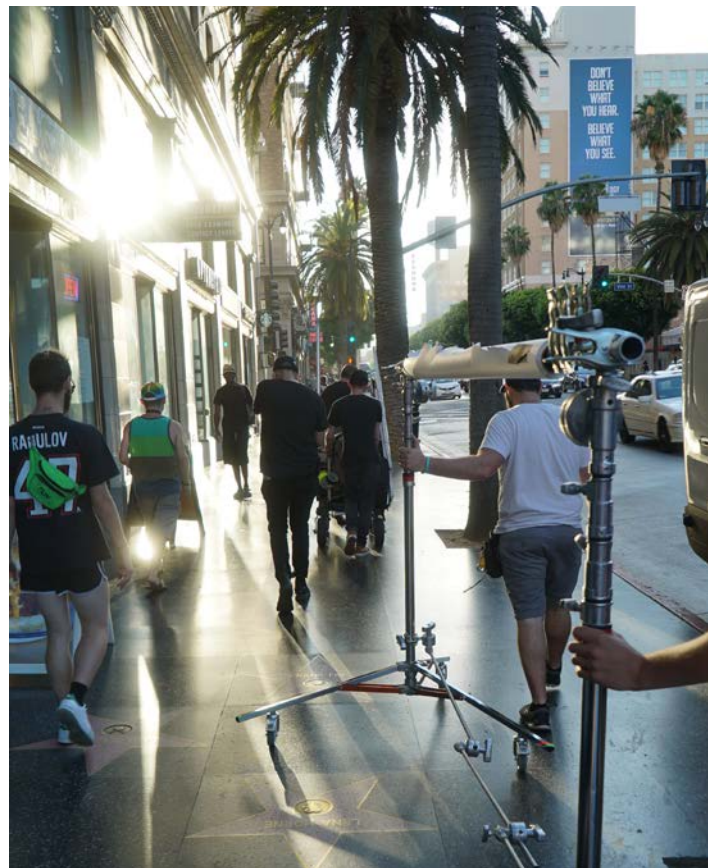
Band Pro tests Angénieux Optimo Primes

"The pleasing color palette of the VENICE camera with the beautiful quality of the Angénieux Optimo prime lens was a super attractive combination for skins tones and making people look wonderful. The Optimo Primes excel at gorgeous skin tones. We did portraits where the eyes are razor sharp but skin tones are nice and smooth, not soft, but just beautiful.

"The Angénieux optical designers say it has something to do with micro contrast. I'm just learning about micro contrast and the more I read about it, the more I hesitate to use the word until I really understand everything about it. Micro contrast preserves sharp details but also softens contrast, smoothing textures out.

"The Optimo Primes have very even field illumination. Out-of-focus highlights in the background are uniformly circular. The lenses seemed to avoid any cat's eye bokeh. Focus is sharp at the plane of focus. It reminds me a lot of what a Full-Frame Summilux-C might be like. The Optimo Prime has a similar kind of image quality, except with a little bit more flaring.

"We worked with the Optimo Primes wide open at T1.8 to about T2.8. Remember, these are Full-Frame lenses and on some of the extreme close-ups, you have to pick which eye to focus on. You have to pick which side of a face should be sharp. That's a beautiful thing for portraits.

"Angénieux specifically asked us to film a large variety of skin tones. So we were lucky to be in a city like LA and in pedestrian areas with access to all kinds of different people.

"The portraits shown here in FDTimes were not processed in Baselight or DaVinci Resolve. It's just me putting RAW files through Sony RAW Viewer with a simple ASC CDL offload.

"There's no chromatic aberration, even totally wide open. There's no vignetting, no port-holing. The Angénieux Optimo Prime

exhibits technical prowess in all the right places and they are, at the same time, also artistic in all the other right places. For example, there's no geometric distortion, but sharp in-focus areas fall off gently in an almost three-dimensional way to areas that are smoothly soft. I think this must also have something to do with Angénieux's long experience making fine lenses that have historically always been stellar at filming the close-ups of movie stars.

Orson Welles would have enjoyed the 18mm Optimo Prime.

Angénieux Optimo Primes

Randy Wedick with Angenieux Optimo Prime, Bright Tangerine clip-on mattebox and VENICE in Rialto mode, which Randy calls "relatively inconspicuous tourist camera mode." Camera body is in backpack. SmallHD monitor on Noga Arm. Below left: Henry Grenier handheld in Hollywood with Optimo Primes, Bright Tangerine Misfit Atom clip-on mattebox, Movcam shoulder rig. Below right: white seamless.

Lens	18 mm	21 mm	24 mm	28 mm	32 mm	40 mm	50 mm	60 mm	75 mm	100 mm	135 mm	200 mm
T-Stop	T2.0	T1.8	T1.8	T1.8	T1.8	T1.8	T1.8	T1.8	T1.8	T1.8	T1.8	T2.2
M.O.D.	14"	14"	14"	14"	14"	14"	16"	tbd	24"	tbd	3'3"	tbd
S35 equiv.	12 mm	14 mm	16 mm	19 mm	21 mm	27 mm	33 mm	40 mm	50 mm	67 mm	90 mm	135 mm

There are three ways to customize Optimo Primes

- An internal element can be replaced. This is done by a certified lens technician.
- The iris assembly can be exchanged with. Various iris blades will be available, matte and reflective.
- A rear filter holder attaches magnetically to the rear of the lens

Current Delivery Plans

- 6 focal lengths: 21, 28, 40, 50, 75 and 135 mm in Q2 of 2020.
- 3 additional focal lengths: 18, 32 and 100 mm in Q4 of 2020.
- 3 more focal lengths: 24, 60 and 200 mm in Q1 of 2021.

Specifications

- Mounts: currently PL and LPL. Probably PV and more.
- Iris Barrel: 80° Rotation
- Focus Barrel: 320° Rotation
- Focus and Iris Gears are all at the same place
- Constant Volume (front and rear elements remain in the same position when focusing)
- 10 of the 12 lenses are the same size

Cost

The complete set of 12 lenses will cost € 245,359 and US$ 308,910.

Angénieux Optimo Prime 40mm Framegrabs

Cooke Anamorphic, Canon C700 FF, Holleran, *The Obituary of Tunde Johnson*

The Obituary of Tunde Johnson *is about a wealthy, gay Nigerian-American teen who is pulled over by police and shot to death. He awakens and relives the same day over and over. It is a psychological journey as he comes to terms with communicating the truth to his family, friends, and himself. Steven Holleran, last seen in FDTimes on the death-defying* Fire Chasers, *shot with Canon C700 FF and Cooke Anamorphic /i lenses.*

JON FAUER: I heard this was the first time the Canon C700 FF Full-Frame camera was used on a feature film?

STEVEN HOLLERAN: I had never used the C700FF before but it interested me for its ability to shoot 4K anamorphic RAW and record simultaneous codecs. This made it a huge plus for our indie production in that we didn't need to render proxies for dailies —they we're just ready to go straight out of the camera. I'm also always pleased by the image quality and dynamic range I get from other Canon cameras so it made sense to go with the C700FF. Canon said that the C700FF had the best low light and highlight capabilities of any camera they produced and this was an opportunity to test it. We had a variety of challenging lighting situations and a cast of various skin tones often together in night and backlit situations. The camera performed in the DI to a degree I never would have imagined. The detail was astounding. It's a real testament to Canon's color science.

Why did you require a Full-Frame camera with Cooke Super35 anamorphic lenses? Why not use the Canon C700?

Because C700 cameras (and many other Super35 digital cameras,

but all) have a sensor height of 15.2mm and a width of 28.9mm. Super35 anamorphic specifications derive from a 4-perf film gate that was 18.6mm high x 21.95mm wide. So, if you want to work with the full height of the anamorphic image, the Canon C700 FF accommodates this (effective image area of 20.1mm high x 38.1mm wide). In anamorphic mode, the extra sensor area is cropped.

Please tell us about Cooke anamorphic lenses and look.

Choosing Cooke Anamorphic/i lenses was based on our main character's psychological journey and my desire to visually follow a descent into his mind and back again. Cookes have a notorious cinematic look to them but I also knew they had some aberrations at certain focal lengths and an extreme softness wide open.

I wanted to work with these qualities rather than have a set of lenses that would be too pristine. It's like a painter having an extra set of off-color pigments that allow for unexpected and remarkable results.

If there were a moment that begged for surrealism, I could jump to the 75mm and frame the image in a way where we could use the soft left edge of the lens. I also knew we'd be spending a lot of time in close-ups and I knew the Cookes' pleasing qualities and soft fall-off would be ideal. There's unique interplay we got when using anamorphic lenses in the big modern locations we had. We could bend straight lines and really push the characters into certain parts of the frame to heighten their isolation.

Steve Holleran with his Easyrig Vario 5 and Flowcine Serene.
Below: Framegrab from *The Obituary of Tunde Johnson*

Describe the look you discussed in pre-pro and the look that you wound up with?

Director Ali Leroi and I dubbed our look "iced minimalism." I knew we'd be finishing with a cool tone to the film and so we chose as many locations that played into that look as possible (lots of glass, polished concrete and stone floors.) This look is particularly strong in the high school and Tunde's home scenes where Tunde is isolated and falling further and further out of touch with reality.

Production details. Shooting days?

Our production was short. Fifteen shooting days meant we had to be pretty specific about what we shot and when. With just seven or eight days of prep from the day I took the job, we were also on an insanely tight timeline to get prepared for the shoot. It's a testament to the film production, crew, and vendors that we were able to do it that quickly.

Technical details: tell us more about shooting Anamorphic mode with the Canon C700 FF?

We shot full resolution 5.9K in anamorphic mode, which meant we were cropping in-camera down to 4K to lose the unusable left and right sides of the image beyond the 2.39:1 aspect ratio. The full-frame sensor measures 38.1 x 20mm so we had a lot of room to play with our 2x squeeze lenses.

Recording format & resolution and codec?

Our RAW files were sent out to a Codex Recorder with CFast Mags. Internal recording was done as XF-AVC 4:2:2 files. Very useful for post.

Keeping things in focus.

Cooke Anamorphic, Canon C700 FF, Preston LR2, Holleran

Above: Holleran at camera and Scully pulling FF focus. Below: with Canon C700 FF, Cooke Anamorphic /i 50mm, Light Ranger 2.

Anamorphic lenses can notoriously offer a challenge of being tricky to focus. Our 1st AC Dennis Scully, who had worked on the Canon C700 FF demo film shot by Russell Carpenter ASC the year before, knew the camera inside and out. We used the Preston Light Ranger 2 and Preston wireless focus systems to be very accurate with our distances. For example, on an extreme close-up of our main actor Steven Silver, we'd often have to literally choose which eye we wanted to see sharp. Other times we're in raking two-shots in a dialogue conversation between two actors sitting side by side and Dennis is having to pull for every single line in order to register facial expressions. It was quite a challenge and would have been more difficult without the gear and Dennis' expertise.

Festivals and distribution?

This film was the first feature as part of producer Zach Green and Jason Shuman's The LAUNCH: Million Dollar Screenplay Competition. It's a pretty cool new program that identifies and selects one graduating college student and helps them produce and make their film dream come true. *The Obituary of Tunde Johnson*, written by USC grad Stanley Kalu, was the first film from the Launch competition and it's exciting to see it running at the Toronto International Film Festival.

Credits

Cooke anamorphic/i lenses rented from The Camera Division. Canon C700 FF Camera was a prototype. We started shooting in November 2018. Thanks to Tim Smith of Canon. Thanks also to Codex. Post Production at eFilm.

Ronford-Baker Atlas 7, Atlas 50, Slider

Ronford-Baker has 3 new products to show at IBC, in Hall 12—12.D31—for the first time:

1. Atlas 7 360° Rollover Rig is designed to fit onto any fluid head including OConnor and Ronford-Baker. It has 360 degree rotation, 15 variations of fluid control, and zero (fluid free) positions at both ends of the scale.

2. New Atlas 50 Fluid Head with Snap & Go side-loading mechanism allows fast mounting and easy adjustment of camera slide plates. Compatible with ARRI Slide plates and OConnor.

3. New Lightweight Slider. Precision camera movement with smooth and silent operation. Lightweight and modular design.

Also at IBC: demonstrating new Motion Control Software for the Ronford Baker Sliders. This allows recordable and repeatable moves and Time Lapse functionality.

ronfordbaker.co.uk

LEITZ THALIA-T 90mm

The new Leitz THALIA-T 90mm T2.2 is not a typical THALIA. It offers a sequential series of different looks by adjusting the aperture. You can't do this with filters. Wide open, it exhibits a vintage, romantic, slightly hazy and soft look. Stop down and things become increasingly sharper, perhaps less vintage, veering toward post-modern—and totally different. You can see the degree of softening immediately in the viewfinder. Think of the THALIA-T as a time machine in a lens.

It reminds you of Hollywood heyday glamour portraiture—movie stars, Marlene Dietrich, Greta Garbo, Bogart, Bacall, glowing highlights, luminous skin tones). The optical design is essentially a sharp lens with increasing spherical aberration toward the edges of frame. The soft, glowing look is most pronounced at wider apertures. As you stop down, the lens appears sharper. Backlight increases the opportunities for flare and internal barrel haze.

The optical design is similar to the original, legendary Leica Thambar still lenses of 1935 and the Thambar-M introduced 2017. This cine lens version has an additional single-layer coating to protect the optical elements. Wide open at T2.2, the Leitz THALIA-T 90 mm has a dreamily romantic look with distinctive bokeh created by deliberately under-corrected spherical aberrations. Aberrations increase towards the periphery of the optical elements. That is the reason why the depth of field and the degree of diffusion can be nicely controlled via the step-less aperture ring. Widening the aperture increases the soft focus effect and stopping down reduces the effect. The 15-bladed circular iris

creates smooth, round, out-of-focus highlights (bokeh).

The new THALIA-T 90mm comes with the familiar THALIA cine lens attributes. It has modern mechanics, rugged construction and the lens barrels are in the same relative position as the other THALIA lenses (24, 30, 35, 45, 55, 70, 100, 120, 180 mm). The large 60mm image circle diameter covers ARRI ALEXA 65, Medium format cameras (Leica S, Fujifilm GFX100) and all Full-Frame, VistaVision and Super 35 sensors.   *leitz-cine.com*

Focal Length (mm)	90 mm
Aperture	T 2.2 - T25
Image Circle / Illumination Circle	60 mm / 80 mm Ø
Close Focus	3' / 0.9 m
Weight	2.3 lb / 1.04 kg
Length (in)	4.9 in / 124.5 mm
Lens Mount	PL, LPL with /i metadata
Front Diameter	95 mm
Front Filter	92 mm screw-in
Rear Filter	via net holder
Focus Rotation	270°
Iris Blades	15
Iris Shape	Circular through all stops

LEITZ THALIA-T 90mm

Above: Taken with Thalia-T at T2.2. David B. Forer is a principal of a fifty year old investment firm, art collector, accomplished photographer and longtime Leica devotee. He mused about Leitz lenses and the look of *Casablanca*: "They endured because each aspired to be good and honest." Below, at T5.6.

Above: Thalia-T at T2.2. Steve Tiffen, President/CEO of Tiffen Co. in the Sant Ambroeus espresso bar, Southampton, NY. Below, at T5.6. Tiffen NATural ND filters are excellent companions to Thalia-T—letting you change aperture without adjusting ISO or shutter speed while maintaining consistent color.

LEITZ THALIA-T 90mm. Not Just for Portraits.

Above: Thalia-T at T2.2 and big, round bokeh. Below, Thalia-T at T5.6: smaller, round bokeh and sharper lantern. Photos: Jon Fauer.

ZEISS Supreme Prime 150mm

ZEISS will show the Supreme Prime 150 mm T1.8 for the first time at this year's IBC, in booth 12.F40.

The new lens will be shown on a Sony VENICE, ALEXA LF and RED MONSTRO 8K VV.

Order-taking begins at IBC. Shipping starts in December.

The SP150 — as with all other Supreme Primes — features ZEISS eXtended Data.

Now, with Firmware Update 4.0, Sony VENICE cameras support the ZEISS eXtended Data extension of Cooke /i3. That means Supreme Primes are now able to provide a streamlined workflow for cine productions to integrate VFX, no matter the camera setup. It's as simple as Record > Prepare > Use.

Find step-by-step guides that suit your respective production at: *zeiss.com/cine/xd/guides*

So, at IBC, ZEISS is showing the set of Supreme Primes ready at this time: 10 focal lengths from 21 mm to 150 mm. Three lenses remain to be completed in 2020: 15mm, 18mm and 200mm.

For hands-on and eyes-in-eyepiece demos at IBC, ZEISS will show Cinema Zooms, CP.3 primes and the Lightweight Zoom LWZ.3 in addition to the Supremes.

And now there are 10 Supremes

Shown in gray. The 15, 18 and 200 mm are scheduled for 2020.

| Lens	Aperture	Close focus	Front Diameter
15 mm	T1.8-T22	0.35 m / 14"	114 mm
18 mm	T1.5-T22	0.35 m / 14"	114 mm
21 mm	T1.5-T22	0.35 m / 14"	95 mm
25 mm	T1.5-T22	0.26 m / 10"	95 mm
29 mm	T1.5-T22	0.33 m / 13"	95 mm
35 mm	T1.5-T22	0.32 m / 13"	95 mm
50 mm	T1.5-T22	0.45 m / 18"	95 mm
65 mm	T1.5-T22	0.6 m / 2'	95 mm
85 mm	T1.5-T22	0.84 m / 2'9"	95 mm
100 mm	T1.5-T22	1.1 m / 3'9"	95 mm
135 mm	T1.5-T22	1.35 m / 4'5"	114 mm
150 mm	T1.8-T22	1.5 m / 4'11"	114 mm
200 mm	T2.1-T22	2 m / 6'7"	114 mm

ZEISS Burbank

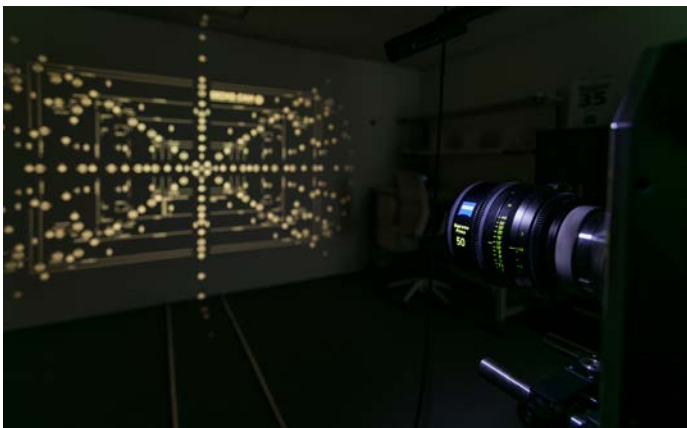ZEISS Cinema Lens Demo Center Entrance.

Museum area and lounge.
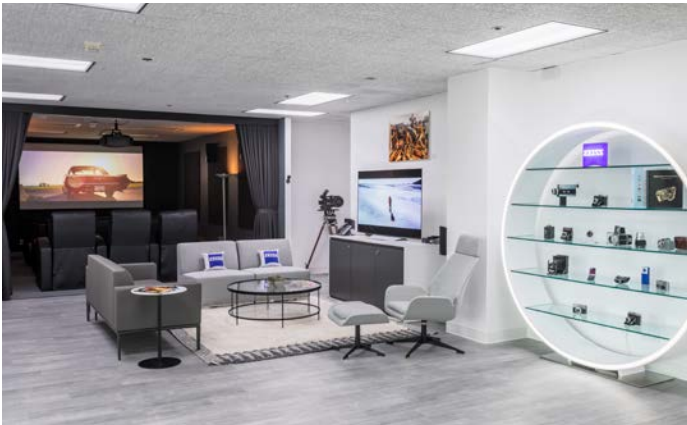
ZEISS Cinema Lens Demo Center at 15260 Ventura Boulevard, Suite 820, Sherman Oaks, CA 91403. Phone: 818-582-4910.

Camera and Lens Prep Area with many cameras from various companies.

Lens Projection Bay.

9-seat 4K HDR Screening Room.

ZEISS has been making cinematography lenses for filmmakers for more than 100 years. At company headquarters in Oberkochen, Germany, each cine lens is designed, manufactured and tested to ensure excellent quality.

ZEISS cine lenses have a versatile, clean look with neutral color rendition. That same aesthetic was applied to the brand's expansion into the greater Los Angeles area. The Cinema Lens Demo Center in Sherman Oaks, which opened earlier this spring, epitomizes that junction between history, technology, and artistry.

You arrive into a space that is clean, white and bright. It reminds me of ZEISS exhibits at trade shows. You spend time at the impressive display of one-of-a-kind vintage ZEISS lenses,

microscopes, and binoculars. It reminds me of a "favorite hits" of the large museum that is next to the lobby in Oberkochen.

A few steps further and you enter an area designed for filmmakers. The space has a 9-seat 4K HDR screening room, complete editorial suite with DaVinci Resolve and Nuke software, and lens projection bay equipped with GECKO-PRO technology. The prep floor has various cameras ready for testing with ZEISS lenses.

Private demonstrations can be booked by appointment, Seminars are held on subjects ranging from large format capabilities, eXtended Data and other topics that ZEISS can support. The new facility will continue to be used regularly for educational workshops and events.

Anton/Bauer Dionic 26V Series

Dionic 26V on ARRI ALEXA SXT

Dionic 26V cutaway view. Do not attempt! Trained product engineers performed this on a closed course. Will void warranty.

Why 26 Volt Batteries?

A number of new cine cameras require more than 14.4 -19 V. And higher voltage can mean lower current (Amps). So, lower current can result in cooler operation and less energy loss over long cables. ARRI moved to 26 V with ALEXA 65, LF and SXT (in photo above). History repeats: the original Arriflex 16SR ran off 12 V batteries and later, the 16SR3 went to 24 V. Arriflex 35-3 cameras used 12 Volts and the Arriflex 435 went to 24 Volts. So, watch 26V batteries become popular for more cine cameras.

Anton/Bauer DIONIC 26V

Anton/Bauer's new DIONIC 26V series of Li-ion batteries provide up to 240 watt-hours for power-hungry cine cameras like ARRI ALEXA 65, LF and SXT.

The new DIONIC 26V batteries will also power LED fixtures including Litepanels Gemini Soft Panels and ARRI SkyPanels.

DIONIC 26V batteries use Anton/Bauer's new Gold Mount Plus to handle the higher voltage and amperage. This mount not only ensures a secure battery-to-camera connection, but also prevents users from connecting a 26V battery to a 14.4V camera or accessory. DIONIC 26V batteries can be hot-swapped as backup power for VCLX block-style batteries or AC power supplies.

The new 26 Volt system includes a quad charger, quad discharger, and various mounting plates that connect to cameras and lighting fixtures. The DIONIC 26V charger handles rapid charging of both 14.4 V and 26 V batteries. (The 98-watt-hour battery charges in about 1.5 hours and the 240-watt-hour in about 3.5 hours.)

Like the other batteries in the Anton/Bauer DIONIC product family, the DIONIC 26V series use a high-strength ABS polycarbonate blend construction that protects the battery and ensures peak performance even in extreme heat, humidity and cold.

A built-in LCD indicator displays the exact runtime and remaining power for camera and accessories.

For air travel, the new The DIONIC 26V 98 watt-hour battery is IATA-certified. *antonbauer.com*

Anton/Bauer Titon-SL 14.4V Series

Titon SL is a new series of lighter and smaller Anton/Bauer 14.4 Volt Gold Mount and V-Mount batteries. (The first-generation Titon batteries were seen at NAB in April 2019.) Titon SL come in 150 Wh and 240 Wh models.

Titon SL batteries have a new cell design that allows the batteries to be more compact. For example, the new Titon 150 now fits into a much smaller housing than the original model.

Titon SL batteries deliver long-lasting power. A single Titon SL 240 can power a Litepanels Gemini 1x1 LED Soft Panel for more than an hour at full power, and two Titon SL 240 batteries on a dual bracket will run it up to 2.5 hours.

Each Gold Mount or V-Mount Titon SL includes P-TAP and Smart USB ports to power accessories such as wireless transmitters, LED lights, wireless lens systems, monitors, smartphones and tablets. With Titon SL's onboard LCD screen or the camera's viewfinder display, operators get a down-to-the-minute view of the exact runtime and remaining power available for the camera and accessories being powered.

Titon SL batteries are compatible with earlier Anton/Bauer chargers. And, they work in temperatures from -4 °F to 140 °F (-20 °C to 60 °C). Titon SL batteries will premiere at IBC 2019 in the Vitec Group booth, 12.E65. *antonbauer.com*

Wooden Camera 26 V Gold Mounts

Wooden Camera's Anton/Bauer 26V Gold Mount Plate

What if your camera doesn't have a 26 V Battery Plate?

Wooden Camera's Anton/Bauer 26V Gold Mount attaches one 26 V battery directly to the back of an ARRI ALEXA LF, 65, or SXT camera to provide power through the rear battery contacts without cables. The internal circuit board prioritizes the 2-pin Fischer DC Power Input, allowing 24V block batteries to be used first while the on-board battery remains fully charged. Hot swapping between battery sources is possible and the OLED screen on the side panel provides voltage data, battery capacity, and active source information. Two Power Taps are provided at regulated 15 V and current is monitored. If you exceed the current threshold, the plate will cut power to the P-Taps, leaving the camera operating normally. A warning message will appear on the OLED screen and you can reset it using the menu button.

Wooden Camera / Anton Bauer 26V Sharkfin Plate

This plate attaches two 26V Gold Mount batteries perpendicular to the back of an ARRI ALEXA LF, 65, and SXT camera.

By way of example, an ALEXA LF with a wireless video transmitter and an EVF can draw up to 160 W while recording. Additional accessories will draw even more current. So that's why this Sharkfin Plate is helpful.

Wooden Camera Unified Cage for ALEXA Mini LF

ARRI ALEXA Mini LF accepts 11 to 34 Volts and draws about 65 Watts. So, it can easily be powered by a 14.4V on-board battery as well as 24V. But we digress.

Wooden Camera's new Unified Cage for ALEXA Mini LF is form fitting, with a 15mm lightweight baseplate that serves as the foundation for all four Wooden Camera ALEXA Mini LF kits: Base, Advanced, Pro (15mm Studio), and Pro (19mm). The ARRI standard base plate quick releases in two ways, allowing you to keep the rods or leave them behind.

Wooden Camera Unified Cage for Blackmagic Pocket Cinema Camera 4K / 6K

This is a Blackmagic Pocket Cinema Camera 4K / 6K Basic Unified Accessory Kit.

The accessory package consists of the Wooden Camera Unified BMPCC4K Camera Cage and the Unified DSLR 15mm Baseplate.

The cage is form-fitting and there are many threads to attach camera accessories. A quick release baseplate holds two 12" long 15mm rods at the correct lens height.

Shown here with wooden top handle.

Wooden Camera LPL Mounts for Cameras to use ARRI Signature Primes

ARRI Signature Prime lenses have LPL mounts. An LPL Mount has a 44 mm Flange Focal Depth and 62 mm inside diameter.

PL Mounts put the lens flange further from the image plane: Flange Focal Depth is 52mm and the inside diameter is 54mm.

LPL Mounts came with ARRI cameras beginning with ALEXA LF. ARRI Rental has retrofitted much of their older camera inventory to LPL. But what is everyone else to do to shoot with Signature Primes on Sony VENICE or RED cameras? Wooden Camera can help.

LPL Mount for Sony Venice

Wooden Camera's ARRI LPL Mount for Sony Venice Cameras has connectors and pass-through for lens metadata to be sent directly to the camera via the pogo pins.

LPL Mount for RED RANGER

Wooden Camera's ARRI LPL Mount for RED RANGER MONSTRO 8K VV camera.

An external LDS-2 connector is in place but is not yet enabled.

Oh, and with all these LPL mounts, if you want to mix and match LPL with PL lenses, ARRI's LPL to PL Adapter is just the thing.

LPL Mount for RED DSMC2

Wooden Camera's ARRI LPL Mount for RED DSMC2 Cameras.

Graduating from IRND to Tiffen Full Spectrum NATural ND Grads

Tiffen introduces new NATural Graduated ND filters

The Tiffen Company's first full spectrum graduated ND filters have arrived. The NATural ND Grads join the existing family of Tiffen NATural ND filters. Full spectrum coverage means they block visible as well as IR and UV light. Because they use the same internal coating technology, they match the neutral image characteristics of the solid NDs as well.

The NATural ND Grads are available as either hard edge or soft edge grads in five stops of darkening: Clear to ND0.3, 0.6, 0.9, 1.2, and 1.5.

Filter Evolution from IRND to Full Spectrum ND

Consistent, full spectrum neutral density has been the holy grail that all filter companies have been chasing. Tiffen solved this problem by creating a full spectrum coating (IR, visible light and UV protection) that is both reflective and absorptive.

The special coating is sandwiched between two pieces of glass that create consistency, protect the coating from scratching, eliminate color variation from filter to filter and from stop to stop, and even match an unfiltered image. These benefits are clear in preserving creative intent of the cinematographer as well as saving money in post-production because less time is spent adjusting shots to match each other.

The Difference between IRND and Full Spectrum ND

Neutral density filtration has undergone an evolution over the last 10 or more years following the transition to digital, the need for IR (Infrared Radiation) protection, and now the demand for neutrality and consistency. Early digital sensors proved susceptible to IR pollution that would color the image, which necessitated the move to NDs that also blocked the IR light spectrum. And while these IRND filters were sufficient at blocking these wavelengths of light, they were difficult to keep consistent because of the dyed glass process used to create them. This had camera assistants spending precious prep time trying to match filters to make sure that once filming began, each shot would match.

Tiffen has been at the forefront of developing cutting edge ND technology. But the latest iteration of neutral density designs, the full spectrum NATural NDs, are another major milestone in Tiffen's development that answers the demand of today's productions elegantly and artfully.

Available in five strengths, starting at Clear to ND0.3 and continuing to Clear to ND1.5 in one stop increments, with the option of either soft (SE) or hard (HE) gradation and in sizes 4x5.65 and 6.6x6.6, Tiffen's NATural Graduated ND filters are available for list prices of $495.00 for the 4x5.65 and $525.00 for the 6.6x6.6.

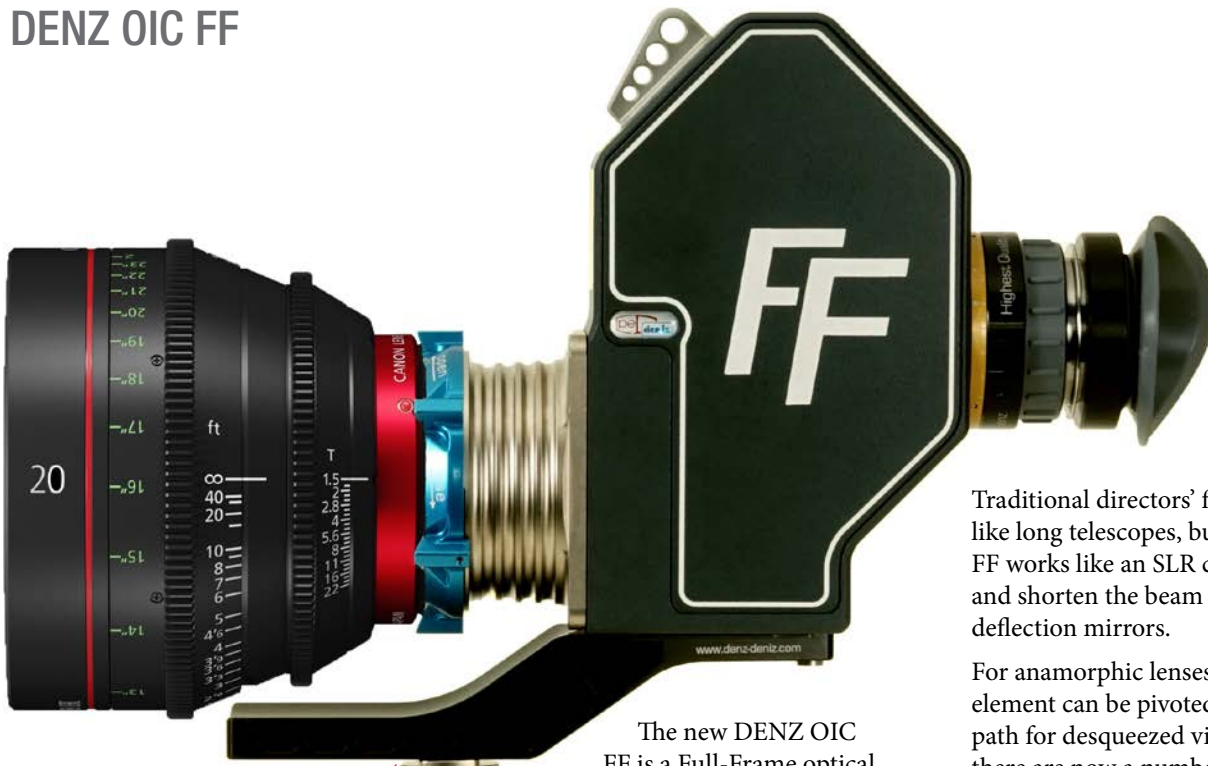## Comparing TIFFEN NATural ND and IRND Filters

TIFFEN NATural ND 0.9
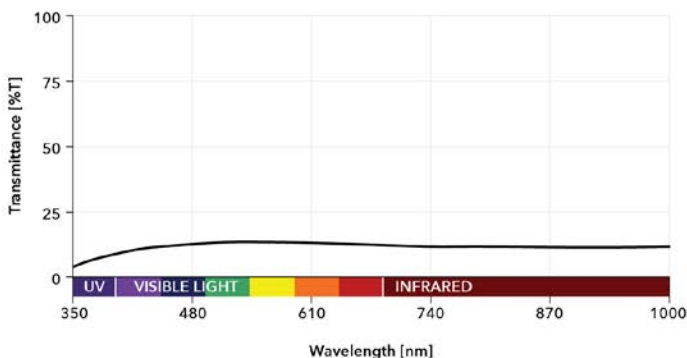
TIFFEN IRND 0.9
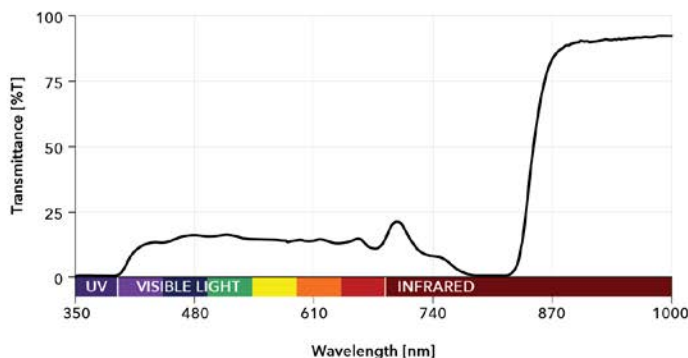
DENZ OIC FF

Traditional directors' finders can look like long telescopes, but the DENZ OIC FF works like an SLR camera to "fold" and shorten the beam path with precise deflection mirrors.

For anamorphic lenses, a cylindrical lens element can be pivoted into the optical path for desqueezed viewing. Because there are now a number of anamorphic lenses with various squeeze ratios, the cylindrical lens element can be swapped. If you only work with spherical lenses, you can buy a DENZ OIC FF without the anamorphic desqueezer for a significant reduction in price.

The OIC FF is dust-proof. The 6x magnifying eyepiece adjusts ± 4 diopters. The lens mount is attached with four screws and comes (so far) in LF, PL , PV, EF, E and R mount.

The ergonomically shaped cherry wood handle is adjustable via a Hirth tooth rosette and sliding plate to balance lenses of different focal lengths and weights. There is a ¼-20 thread on the bottom to attach the OIC FF to a monopod. Overall dimensions are 190 x 185 x 62mm. *denz-deniz.com*

The new DENZ OIC FF is a Full-Frame optical Director's Finder. It uses a plane-parallel groundglass. (A traditional film camera groundglass is usually curved on one side.) Because the DENZ OIC FF groundglass is separate from the field lens, it is relatively inexpensive to provide with many different format markings and aspect ratios. The frame lines are created with a 3D laser holographic-like technology. They are less sensitive than conventional groundglasses and can be easily cleaned with acetone. They cover an area greater than Full Format and show areas beyond the frame lines. So you can see an encroaching microphone boom or errant C-Stand.
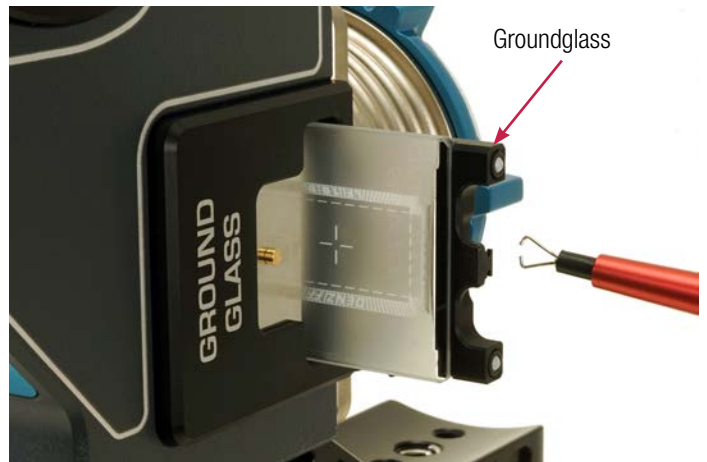
Cherry wood handle tilts and slides to balance various lenses

Spherical or Anamorphic Selector. 2x desqueeze shown here—other ratios available

Diopter adjustment

Groundglass

SHAPE Cages, Batteries and Chargers

Blackmagic Pocket Cinema Camera 6K and 4K Cage

...shown here with 15 mm Rod System and Top Handle. CNC machined of lightweight and strong aluminum.
Easy to assemble and disassemble. Access to all camera controls, ports, and slots.
Cold shoe mount. Multiple 1/4-20 and 3/8-16 mounting threads. BMPCC6KSHAPE.

Panasonic LUMIX S1R, S1 Cage

...shown with 15mm Lightweight Rod System, Mattebox, Follow Focus, Wooden Push-Button Top Handle compatible with Panasonic DMW-XLR1 Audio Unit. LS1ROD.

As with all SHAPE Cage systems, there are numerous configurations and accessories, from a basic setup (shown here) to a full shoulder mounted system with handgrips, shoulder pad and mattebox.

SHAPE BP-U65 14.8 V Lithium-Ion Batteries With Dual LCD Charger

SHAPE BP-U65 Lithium-Ion 14.8 V 65Wh Batteries are compatible with Sony BP-U batteries that power Sony PMW or PXW series cameras.

This 14.8 Volt, 5200 mAh battery has no memory effect. Accurate power metering and battery electronics ensure a full charge. A D-Tap output is provided for accessories as well as a 5V USB port to charge a smartphone or mobile device. Both ports can also be used to charge the battery with a USB or D-Tap power source. Battery capacity can be quickly checked by viewing the 4-segment LCD display. BPU2B kit comes with 2 batteries, charger, AC and Car Power cables.

SHAPE NP-F980 7.4 V Lithium-Ion Batteries With Dual LCD Charger

SHAPE NP-F980 6600mAh Lithium-Ion Batteries power Sony L-series cameras, Atomos monitors, SmallHD monitors, or any equipment that accepts an L-series NP-F980 battery.

This 7.4V, 6600mAh battery has no memory effect. The Intelligent MCU identifies the voltage of the battery and prevents overcharge. A 5V micro-USB port is provided to charge the battery with a separately available wall plug adapter or USB power source. Battery capacity can be quickly checked with the 4-segment LCD meter. NPF2B kit comes with 2 batteries, charger, AC and Car Power cables.

Cage For Atomos Shinobi 5" Monitor with Swivel Rod Clamp

Atomos Shinobi is a 5" HDR Photo and Video monitor with a built-in video recorder (up to 4K 29.97p).

This SHAPE cage secures the Atomos Shinobi monitor to your camera with a form-fitting cage made of CNC machined aluminum. The cage protects the monitor against unexpected damage from banging into things or things banging into it. The original Atomos sunshade fits with the cage attached. There are many mounting points with ¼-20 and 3/8-16 threaded holes that have ARRI anti rotating lock locating holes. The OBIROD kit includes cage, HDMI cable lock, swiveling 15 mm rod clamp, 15 mm LW support rod clamp for top handle, and 15 mm 6" rods.

Shown here: Cage for Atomos Shinobi mounted on 15 mm LWS (Lightweight Support) rod.

cmotion

cPRO hand unit   cPRO-ONE hand unit

cmotion cPRO camera control

It's been one year since cmotion delivered their first cPRO LCS (Lens Control System). Now, cmotion's latest and most advanced lens control system is ready to receive its eagerly anticipated third software release. Camera control is now available for ARRI, RED and SONY cameras on both cPRO and cPRO ONE hand units. The advanced but intuitive user interface lets you change frame rate, shutter angle, ISO, white balance, internal ND filter (where available), playback (including multiple clips), and trigger camera user buttons.

Dennis Boehm, cmotion product manager, explains, "With the cPRO, we wanted to offer an outstanding lens control system at a competitive price without compromising on features. When we first started developing the cPRO, we asked many focus pullers what their most requested features were. Camera control was definitely on top of the list. We are thrilled that we can now offer it." Camera control for cPRO and cPRO ONE is available now as an individual license key.

cmotion cvision

cvision focus assist on camera

Pulling focus is an art, but distance measurement is a science.

The cvision measurement unit has two small cameras inside to create and display a stereoscopic depth map from 250,000 real-time measurement points. Various measuring and autofocus features are accessible through the live-view touch screen display.

Single point lets you measure the set on the fly.

Tracking locks onto and tracks a subject throughout the shot. You can even pre-select the subject before entry into the frame.

Nearest lets you select a user-defined area where the closest subject to the camera is measured and kept in focus—which is a great way to get sharp shots during a run and gun job.

A to B lets you define 2 independent focus points and switch between them instantly or with a ramp for a smooth transition.

In combination with a cPRO lens control system, cvision offers advanced autofocus features as well as manual control at the press of a button. The unique color-coded depth of field focus peaking indicators guide you when pulling focus manually. (See examples at left and below.) The cvision system is a helpful focus assist on set, on location, and essential for Full-Frame productions everywhere. By the way, cvision can also be used on its own for unmanned cameras in a broadcast environment.

cmotion cvision is now available to order through all cmotion sales channels. *cmotion.eu*

depth of field display — focus set too close, on foreground

depth of field display — focus correctly set on subject

depth of field display — focus set on background

Bright Tangerine Left Field Cage for Canon EOS C500 Mark II

Bright Tangerine presents their new Left Field Camera Cage for the Canon EOS C500 Mark II Full-Frame cinema camera.

Bright Tangerine was invited to work with Canon to develop a cage system while the camera was being developed. The new EOS C500 Mark II camera fitted with Bright Tangerine's Left Field Cage will be displayed at IBC 2019 in the booths of Canon (12.D60) and Bright Tangerine (12.E69).

Having done the Canon EOS C200 Left Field Cage, Bright Tangerine's EOS C500 Mark II Cage has a seamless, form-fitting design that removes any physical stress from the camera body.

The quick release system securely works with any ARRI Standard compatible dovetail, even those that are out of specification due to wear and tear. It does not require manual adjustment of clamping tension. The cage has been specifically designed to let camera operators or assistants effortlessly handle the camera, even with gloves.

Design features include:

- New patented Open•UP quick release system.
- Operator friendly—makes balancing easier on gimbals or handheld with additional C500 Mark II modules.
- Slim and low profile with no hard-to-reach buttons or dials.
- Lighter and stronger—complete camera protection without excess baggage.
- Matte anodized finish for durability.
- Extremely lightweight – Only weighs 1 kg (2.2 lb).

The updated Left Field Universal 15mm LWS Baseplate's Open•UP quick release system lets you slide, lock and vertically release in seconds without the risk of the camera coming off.

Two 15mm rods can be mounted on either side with a single clamp locking down on both sides.

The Canon EOS C500 Mark II has an optional extension unit that adds length to the body. By using the sliding top plate, operators are able to balance the camera for better weight distribution and ergonomics.

The Canon EOS C500 Mark II Left Field Cage is completely built and manufactured in the United Kingdom at Bright Tangerine Headquarters, based in Church Crookham, Hampshire. It joins the rest of the Left Field camera accessory line-up for the Canon EOS C200, Sony VENICE, RED DSMC2 and ARRI ALEXA Mini.

The addition of the new Canon EOS C500 Mark II Left Field Cage compliments the rest of Bright Tangerine's product line: matte-boxes, follow focus, lens support, Titan Arm, Drumstix Sterling Titanium rods and more.

The Canon EOS C500 Mark II Left Field Cage will be available as a complete kit or as individual components (baseplate, top plate, side plates). *brighttangerine.com*

Tilta Armor Man 3

Tilta Armor Man 3 is a versatile stabilizing and support system for handheld gimbals.

Newly designed dual-function spring arms can be attached in two places: for normal/low or high angle shots.

With the arms in the high position, they come over your shoulders. You can raise the camera and gimbal for very high-angle shots.

In the side position, the arms come out and around your arms. This is similar to the original Armor Man's range of movement, but the operation is smoother.

Maximum payload is now 25kg. An improved triangular mechanical structure makes the arms easier to operate.

The Armor Man vest has a new design for greater operator comfort. The vest is breathable and separated at the back to allow more freedom of movement, especially when you bend. There is more padding and it is easy to adjust to fit most body shapes. Weight is evenly distributed.

The Quick Click quick release system is compatible with full-size handheld gimbals: Ronin 2, Movi Pro, Maxima, etc.

tilta.com
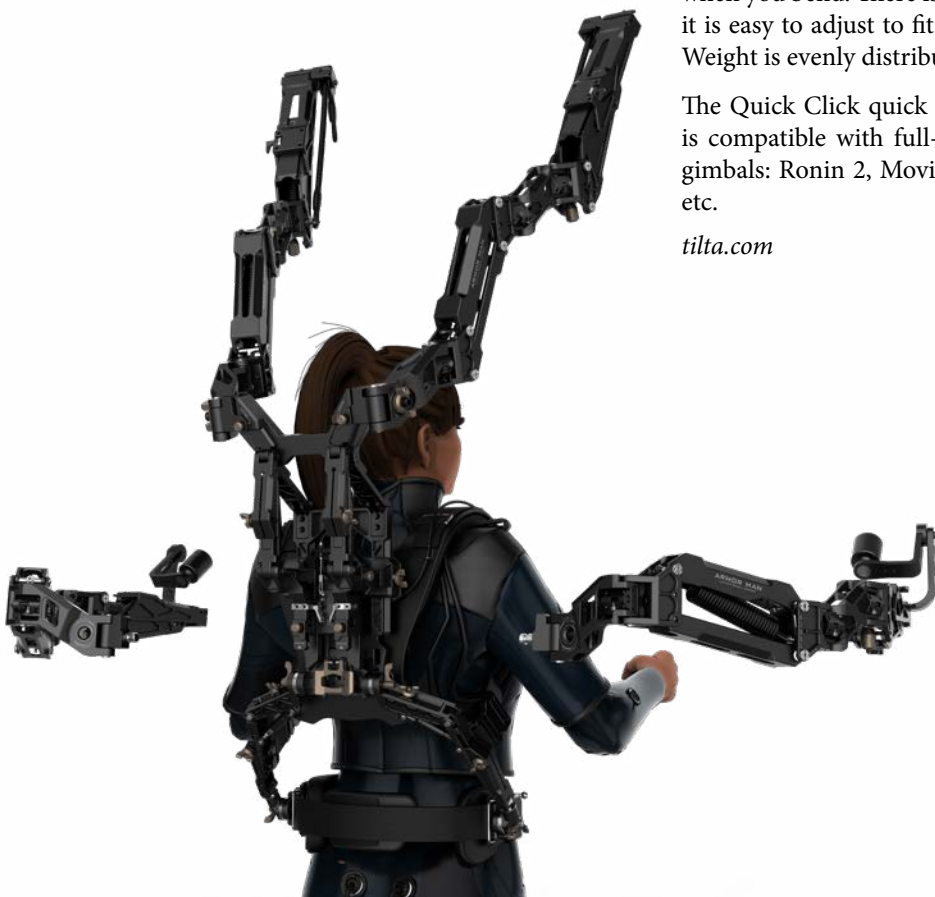
Canon DP-V3120 4K Reference Display

In addition to the new C500 Mark II, Canon also announces their new DP-V3120 4K 31-inch Reference Display Monitor. This is the 4K HDR high luminance display that you'll want as your Cinematographer Monitor, on a DIT cart, or in the grading suite. It provides accurate color reproduction, high luminance and high contrast in a rugged body for long hours on location and in the studio. It is equipped with an HDR Toolkit for faithful presenta-

tion of High Dynamic Range images. Full-Screen Wipe and Dual View functions lets you compare the same image in SDR or HDR. The HDR toolkits include HLG and PQ metering scales, and more. There are four 12G-SDI inputs for 8K, 4K and HD video. The DP-V3120 occupies rarified space: it meets the requirements for Dolby Vision certified facilities. Price is around $39,000 when it ships in November.

	Panel Type	IPS LCD panel with anti glare coating
	Screen Size / Aspect Ratio	31.1 inch (78.91cm) / 17:9
	Resolution / Pixel Pitch	4096×2160 (8.8 megapixels) / 170 μm/149 ppi
	Active Display Area	Approx. 698.0 × 368.1 mm
	Brightness	Peak, Full screen white: 2,000 cd/m2 (2,000 nits). Standard 100 cd/m2 (100 nits).
	Contrast Ratio	2,000,000:1
	Viewing Angle (Up, Down, Left, Right)	89° at contrast ratio 10:1 or higher
	Backlight Type	LED
	Power	100 - 240 V AC, 50/60 Hz
	Power Consumption	At maximum load (including change in brightness due to aging): Approx. 840W (Ex factory: Approx. 175 W)
	Dimensions (Width x Height x Depth)	Approx. 749×492×335 mm (including handle)
	Weight	Approx. 31 kg
	Mounting Hole Pitch	VESA standard 200×200 mm
INPUTS	12G/6G/3G/HD/SD-SDI	4x (1 channel) BNC (75 Ω) Receptacle terminals 12G-SDI: SMPTE 2082 compliant 6G-SDI: SMPTE 2081 compliant 3G-SDI: SMPTE 2048-2/274M/296/372/425-5/425-3/425-1/428-19/428-9 compliant HD-SDI: SMPTE 2048-2/274M/292-1/296/428-19/428-9 compliant SD-SDI: SMPTE 259M compliant
INPUT	HDMI	1 Type A Copy protection: HDCP 2.2
OUPUTS	12G/6G/3G/HD-SDI	4x (Pass-through 1 channel)
	Headphone	1 stereo mini-jack, supported impedance: 32 Ω - 64 Ω
MISC	USB	1 USB type A receptacle Universal Serial Bus Specification Revision 2.0 compliant LS (Low Speed)/FS (Full Speed)/HS (High Speed) mode compatible Enhanced Host Controller Interface Specification for Universal Serial Bus Revision 1.0 compliant
	LAN	1 RJ-45 terminal, IEEE802.3 10BASE-TX / IEEE802.3u 100BASE-TX compliant
	REMOTE	1 RJ-45 terminal, GPI 8 pin

These are preliminary specs and subject to change

Kino Flo and the Planckian Locus: Turning the Tables on Camera LUTs

"Planckian Locus" is not the beginning of a Harry Potter story. We'll get to it later. Let's start with Camera LUTs.

Typically, we have usually adjusted cine camera LUTs to accommodate the way the camera "sees" the lights on set and lighting conditions on location. Now, Kino Flo has turned the tables on Look Up Tables. New Kino Flo firmware effectively white balances their LED fixtures to the cameras, rather than the traditional other way around. This is important because camera sensors have different spectral sensitivities and they "see" light in different ways.

The result is an artistic matching of light that can be seen in skin tones and significantly truer color rendition.

Kino Flo True Match firmware 4.01 includes LUT profiles for the Panavision DXL, Sony VENICE, ARRI ALEXA and Panasonic VariCam. Additional cameras will be added in upcoming firmware releases.

True Match Firmware is currently available on these Kino Flo fixtures: Celeb 250, 450, 450Q, 850; Diva-Lite 41/31/21 and 30/20; FreeStyle 4/41/31/21; Image L80/L40; and Select 30/20.

John Schwartzman, ASC recently worked with a beta version of the new True Match firmware on *The Highwaymen* (Netflix) and *Last Christmas*. He said, "Cinematographers get paid to make the subject look good; we live and die by the close ups. Once I selected the Panavision DXL setting from the Celeb and FreeStyle menus, lighting in the camera profile mode took our images to a whole new level."

To work with Kino Flo LUTs, press the green menu button to the left of the display screen and scroll down to Camera LUT. Press the control knob and the choice of cameras is shown. At this time, the Camera LUT only affects the light output in Kelvin and Green/Magenta modes. Future firmware updates will apply the corrections for the entire color gamut.

In addition to profiles, Kino Flo's new firmware has expanded the color control for Kino Flo Celeb LEDs, FreeStyle LED Fixtues and Tubes, Diva-Lite LEDs , L80 and L40 Image LEDs.

Color Space Selection

Color Space (white point and RGB primary colors) is a way of matching color points between manufacturers. This can take the guess-work out of post-production color grading. Color Space choices are: Rec.709/sRGB, P3 D65, Rec.2020, and ESTA E1.54.

CIE xy Mode

CIE xy chromaticity shows a color value by its X and Y coordinates. For example, with a hand-held color meter like the Sekonic C-800, you can measure the CIE xy values from any light source, as for example a weirdly vaporous street lamp, and then input those CIE xy coordinates into a Kino Flo LED fixture to match that color.

DMX Control of FX

Kino Flo's DMX Control now operates lighting effects on Kino Flo LED FX presets, including Candle, Fire, TV, Police, Lightning, Paparazzi, Pulse and Scroll.

Understanding Color Gamut

Kino Flo president Frieder Hochheim has always been very good at explaining lighting in understandable terms. Here he is on LEDs: "The color science of LED lighting is to cinematographers what natural pigments were to the Old World masters like Rembrandt and Vermeer. With new features like camera look-up tables and advanced gama controls, cinematographers can mix their own LED 'dye, color and shading' to control the look of the final image."

During a series of international cinematography workshops this year, Frieder outlined the industry's ongoing journey toward creating artificial light sources that render color naturally on cinema cameras.

Of particular interest are new technologies for measuring color indexes and how color gamut relates to the reproduction of true white light for modern motion picture and television production.

Kino Flo's comparative report on the Color Rendering Index (CRI), the Television Lighting Consistency Index (TLCI), IES TM-30-15, and the Spectral Similarity Index (SSI) has been received with enthusiasm from production lighting audiences throughout Europe, Australia, and North America.

"The first step is understanding how cameras and sensors 'see' white light and the color gamut," Frieder said. "Achieving full color rendition requires a balancing act on the high wire that is the Planckian Locus (a.k.a. black body curve). This is what we mean when we refer to the science of color for LEDs."

Since developing a color science department for its True Match fluorescent tubes in the 1980s, Kino Flo has been hard at work on LED design and manufacturing, creating color-correct and color-stable lines of tungsten and daylight LED emitters. The company has been obsessed with color quality for more than three decades of production lighting design across all product models.

Easyrig STABIL

New Zealand Cinematographer David Paul working on a Netflix series with the new Easyrig STABIL arm.

Stabil is a Swedish word that means stable. Steady and smooth also come to mind. That's the name of the new Easyrig STABIL.

Easyrig inventor, cinematographer and president said, "The Easyrig STABIL was released at NAB 2019 in response to years of users asking for something to smooth out shots while walking with the rig.

"The Easyrig STABIL is incorporated into the Easyrig system and provides very even and ergonomic weight distribution.

"Easyrig STABIL can be mounted onto your existing Easyrig Cinema 3 or Vario 5.

"The Easyrig STABIL together with the Gimbalrig vest and the Vario 5 system weighs 8 kg / 17.6 lb.

"The STABIL arm can support camera systems from 5-25 kg / 11-55 lb."

- For more information: *easyrig.se/accessories/easyrig-stabil/*
- Video on installing STABIL: *youtu.be/e_JoqH3DYLI*
- At IBC booth 12.D75

Imagine one powerful, tunable, open-face LED fixture combined with a selection of PAR style reflectors, lenses, projection permutations and diffusion options. ARRI Orbiter is a new, bright, tunable and directional LED lighting fixture. Orbiter can change the shape and color of its light output more readily than a chameleon or cuttlefish. One Orbiter fixture can easily work as an open face light, softlight, projector, ellipsoidal reflector spotlight, searchlight, bounce light, book light, China Ball and more.

The ARRI Orbiter draws approximately 400 Watts. That's the same power draw as an ARRI L10 LED fixture, whose output we have roughly compared to a 2K Tungsten Fresnel. As a softlight, it would be close to a 2K Zip Light. I'm going to have to work with Orbiter more before coming up with analogies for its prodigious projection and PAR-style configurations.

Trading Faces: ARRI Orbiter Options

Open Face 30° Left Side

Open Face 30° Right Side

Open Face 15° Wide Beam

Open Face 60° Narrow Beam

Dome L Soft China Ball style attachment

Projector 35° Beam

Front without Optics

Rear

Trading Faces

ARRI Orbiter's Quick Lighting Mount (QLM) lets you connect attachments, reflectors and lenses with all kinds of different characteristics. The high-output, directional beam in open face configuration can send light over long distances. The precise projection optics create a circle of light that can be shaped with French Flags, cutters and gobos. The dome creates soft ambient light. A universal QLM adapter provides a mounting point for Chimera and DoPchoice diffusion that are specific to the Orbiter.

Open Face: The open face optics produce a high-output, directional, PAR-like beam of light in several different beam angles including 15°, 30°, and 60°.

Projection: Two types of projection optics are available at the moment. They contain quality lenses that provide even illumination and uniform color across the entire field. The fixed beam angles available are 15°, 25°, 35° (wider angles may be added in the future). Zoom projection optics are also planned.

Dome: The dome optics are fabric spheres available in three different diameters—small (approx. 0.25 m), medium (approx. 0.5 m) and large (approx. 0.9 m).

Light Bank: The QLM light bank adapter accepts Chimera and DoPchoice products. They attach easily without the need for additional optics and turn the Orbiter into a large single soft source with high output.

Light Engine

Light engine is engineering-speak for the LED equivalent of a lamp inside a fixture. Discussions about light engines usually include the LED chips and the circuit board onto which they are mounted. ARRI Orbiter fixtures have a Spectra six-color light engine inside, consisting of red, green, blue, amber, cyan, and lime LEDs. The ARRI Spectra six-color light engine offers a wider color gamut (15% more colors) than previous ARRI LED fixtures, more accurate colors, and higher color rendition across the entire CCT (Correlated Color Temperature) range. CRI average is greater than 98. TLCI average is greater than 95. CCT adjusts from 2,000 to 20,000 K.

The Orbiter light engine is 76 times smaller than the one inside an ARRI L10, but as mentioned earlier, draws the same amount of power and provides brighter light. More than 190 LEDs squeezed into a dense array create a point-source quality to the light. These LEDs have never been used before in a luminaire.

Orbiter is extremely bright, directional and tunable. It can create hard shadows with defined edges or work as a large soft source with almost no shadows at all.

Technology

Orbiter is ARRI's most technologically advanced luminaire. Its processor is four times faster than the SkyPanel, with 125 times more memory. Get ready for many software updates and new features as users and designers come up with new ways to light.

ARRI Orbiter

Orbiter uses a combination of three dimming techniques, from 100% to 0, smoothly and without color changes. Orbiter includes a lightweight internal power supply and a 3-pin XLR connector for 48 V batteries. A new weatherproof housing keeps Orbiter "happy" in rain, snow, and hostile environments. The cast aluminum body has bumpers made of reinforced plastic. A handle on top makes for comfortable carrying or balanced handheld operating.

LiOS Software

Orbiter's new software is called LiOS (Lighting Operating System) and it benefits from more than five years of development for SkyPanel. LiOS controls eight color modes, including: CCT, HSI, individual color, x/y coordinates, gel and source matching, lighting effects, and a new color sensor mode that measures the qualities of ambient light and lets Orbiter recreates it. Additional new features in LiOS include simplified DMX modes, more than 240 presets for favorites to be stored, optics recognition, multi-language support, custom boot screen, operational modes to optimize the fixture's performance and many more still to come.

Removable Control Panel

The Orbiter control panel is very good. It has a 4-inch LCD full-color screen, tactile navigation buttons and an intuitive user interface. Best of all, the control panel is removable from the Orbiter. It can then be tethered to the fixtures and used handheld with a 5 or 15m (16.4 or 49.2 ft) control panel cable.

Connections

Orbiter has all kinds of inputs and outputs. There are two

EtherCON ports for Ethernet daisy-chaining via Art-Net 4, sACN, and TCP/IP. Two USB-A ports enable LiOS updates via USB stick and connection of third-party peripherals such as Wi-Fi USB dongles and so on. LumenRadio's CRMX system for wireless DMX communication is included. A sync port connects Orbiter to a wide variety of motion picture cameras for frame-accurate syncing to the LEDs' frequency. Two 5-Pin XLR DMX connectors enable conventional DMX & RDM communication in and pass-through. An SD Card slot is there for future software expansion and as a second way to update firmware. A USB-C port is available for computer connections and servicing.

Sensors

Orbiter is aware of the world around it. Cameras and lenses now longer have the monopoly on set for metadata. Orbiter has a color sensor built in to measuring ambient light that it can match when summoned. A 3-axis accelerometer and magnetometer measure pan, tilt, roll, and heading of the fixture. This kind of metadata can be useful if you have to recreate a lighting setup at a later date or the VFX department wants a log of settings. Heat sensors monitor the LEDs and electronics. A light intensity sensor automatically dims the control panel display.

Applications

Orbiter will wind up everywhere a versatile lighting fixture is desired: motion picture and television production, still photography, broadcast, theater, live entertainment, events, inaugurations, coronations, museums, architecture.

More information: *arri.com/orbiter*

OConnor Ultimate 1040 flowtech100 System

- flowtech is easy to transport
- The ergonomic carbon fiber leg design provides exceptional torsional stiffness.
- For extremely low and high shots, the versatile hinge lock mechanism offers various angles to spread the legs.
- A carbon fiber mid-level spreader ensures fast and stable setup in narrow spaces or on uneven terrain.
- Flowtech legs have been extensively tested for endurance until all kinds of environmental conditions.

ocon.com

The Oconnor Ultimate 1040 flowtech100 system brings together the precision ultra-smooth fluid camera movement that has made OConnor heads famous together with the speed, agility and stability of the flowtech tripod system.

OConnor Ultimate 1040 Fluid Head

The Ultimate 1040 fluid head is for lighter payloads, from 0 to 45 lb. (20 kg). It has the same build quality and familiar movement found in the larger OConnor 2575 and 2065 heads.

The Ultimate 1040 is lightweight yet sturdy. It includes a stepless pan and tilt fluid drag system designed to provide control and stability. The OConnor Sinusoidal Counterbalance system provides accurate balance at any point in the tilt range for lighter-weight cameras. It also includes a zero setting. The Ultimate 1040 head is made of magnesium and aluminium alloys as well as stainless steel and carbon fiber.

- The versatile OConnor Ultimate 1040 supports camera and lens systems from 0 to 45 lb. (20 kg) at a 5" (15cm) center of gravity and a +/-90° tilt range.
- Total system weight is 8.7kg.
- Tripod, carry handle and feet: 3.5kg
- Head, Large Europlate assembly, plate and tiedown: 4.8kg
- Pan Bar: 0.4kg

OConnor flowtech100

Pair the Ultimate 1040 head with the OConnor edition of the flowtech100.

The unique OConnor edition of the carbon fiber flowtech100 tripod provides camera operators with an incredibly fast, lightweight and easy-to-setup camera support with quick release brakes and snap-on rubber feet.

The carbon fiber flowtech100 tripod provides cinematographers and camera operators a fast, lightweight and easy to set up camera support with quick release brakes and removable rubber feet. With a 100mm bowl, the OConnor flowtech100 is able to support a payload of up to 30kg (66 lb).

- Deploy and adjust the tripod in an instant: flowtech has one quick release brake on each leg.

RED RANGER HELIUM & RANGER GEMINI

September 9, 2019. RED DIGITAL CINEMA announces that HELIUM 8K S35 and GEMINI 5K S35 sensor cameras join the MONSTRO 8K VV in the RED RANGER rental lineup.

Remember, RED RANGER MONSTRO 8K VV are only available through rental houses. These two new models are offered for anyone who prefers an integrated, all-in-one system to the more modular RED DSMC2 camera. Both lines now share the same choice of sensors.

All three sensor versions in the RED RANGER camera system are housed in a similar, compact, standardized camera body, weighing around 7.5 pounds (depending on battery). Both V-Lock and Gold Mount battery options are supported. You can also plug in an external power supply for power-hungry configurations that use lots of accessories like on-board monitors, transmitters, LR2, CineTape, etc. There's a large fan for quiet, efficient temperature management.

The RED RANGER camera system has three SDI outputs (two mirrored and one independent) so you can have two different looks going to different monitors on set—for example, Director and DP or DIT. The cameras accept power input from 11.5V to 32V. Accessories can be plugged into 24V and 12V power outs (two of each) and one 12V P-Tap. Other connections include an integrated 5-pin XLR stereo audio input (line/mic/+48V selectable), genlock, timecode, USB, and control.

As with all current RED cameras, RANGER cameras can simultaneously record REDCODE RAW plus Apple ProRes or AVID DNxHD or DNxHR at up to 300 MB/s write speeds. They include RED's end-to-end color management and post workflow with the enhanced image processing pipeline (IPP2).

So, RED now offers two separate but equally compelling product lineups to give users more creative choices. The DSMC2 system continues to provide a flexible and modular cinema camera with many configuration options. It's like a sports car with a trailer hitch onto which you can add all kinds of things. RED RANGER is like an SUV, an excellent choice if you want a standardized, all-in-one camera.

RED Digital Cinema President Jarred Land said, "In collaboration with rental houses to bring the RANGER MONSTRO to market, we have heard great feedback from customers, inspiring these two new variants. We're excited to offer the RANGER lineup to a wider variety of professional productions and look forward to seeing the amazing images that are created."

RANGER HELIUM and RANGER GEMINI ship complete with:

- New Production Top Handle
- Shimmed PL Mount
- New LCD/EVF Adaptor D with improved cable routing when used on the left side of the camera
- New 24V AC power adaptor with 3-pin 24V XLR power cable, which can also be used with 24V block batteries
- 4-pin 14V XLR power cable for use with 14V block batteries
- Lens mount shim pack
- Compatible Hex and Torx tools

Also, RED plans to introduce Canon EF Mount versions of both RANGER HELIUM and RANGER GEMINI later this year.

Pricing is $29,950 / €27,450 / £24,750 for RANGER HELIUM and $24,950 / €22,850 / £20,650 for RANGER GEMINI.

The cameras will be on display at IBC in the RED meeting room on the 4th floor of the Elicium at the RAI, from September 13-17.

Go to www.red.com/red-ranger for more information, or visit your local RED Authorized Dealer.

Jarred Land on RED RANGER HELIUM & RANGER GEMINI

JON FAUER: What gave you the idea to do the RANGER HELIUM and RANGER GEMINI?

It spawned from our rental house event at Cine Gear Expo this year. The rental houses expressed interest in the S35 variants because they had many requests from their customers seeking specific S35 glass.

I guess rental houses liked the RANGER MONSTRO 8K VV concept a lot. And owner/operators wanted in on something similar?

Yes, you could say that. There are distinct benefits to both small and modular as well as all fully integrated.

Which users asked for RANGER HELIUM and RANGER GEMINI the most—rental houses or owner/operators?

Definitely rental houses. Mostly because they have been the gatekeeper of RANGER since its inception. Of course, we also had many of the owner/operators, but the only way that could happen is if the rental houses gave the two new variants their blessing for creation, as well as their blessing for opening them up to the wider market.

So, does this mean that Super35 continues to thrive alongside VV?

Absolutely. You know I am passionate about VV, and when we released our first full frame cinema camera, I hoped that the industry would accept the format, because the benefits are enormous. Everyone did. Not only did lens companies step up in a big way but so did other camera companies, and I think it's great for the future of our industry. But S35 still has its advantages.

What are the advantages of Super35? Cost of S35 vs VV? Or existing S35 lenses?

Both. Cost of course is a big factor especially in this ever-changing market – that's probably the biggest reason. But some people just prefer S35. Either because they have a heavy investment in glass already, or they need the increased focal length that a small

sensor provides. Size is a factor as well. Usually with a smaller sensor you can make smaller cameras.

What is the ratio of S35 usage compared to Full-Frame/ VV?

It depends on the market. For most larger features, it is heavily falling towards the full frame/VV sensor size, especially with Panavision doing such a great job with the DXL.

I guess this gives users more choices?

Absolutely. And that's a good thing, right?

Choices are good. When will these cameras ship?

We are making them now, and customers should start receiving them before the end of this month.

How do the lens mounts differ?

The difference with the lens mounts on the RANGER is that the RANGER is a shimmed mount, meaning they no longer have the in-camera back focus adjustment. That was another request from the rental houses. Sometimes simple is better.

Can you put on other mounts besides PL? LPL? Leica M? PV?

Yes of course. RANGER still has the changeable mount interface.

I have not published prices for RANGER MONSTRO 8K VV because I don't have them. Should I, by way of comparison?

Need to ask the rental houses :)

Question you may not want to answer: is there a chance for a RANGER Full-Frame / VV of some kind for owners someday?

Ha, I hate to do this two questions in a row, but you need to ask the rental houses. It really is up to them. If they give us that guidance, then of course we would consider it. As much as it is an obvious benefit for RANGER MONSTRO to be "exclusive," there is also a benefit for more RANGERS to be out in the world and being used, as rental houses benefit from the marketing and demand that a wider audience brings.

RED RANGER Family

	MONSTRO 8K VV	HELIUM 8K S35	GEMINI 5K S35
SENSOR TYPE	MONSTRO 35.4 Megapixel CMOS	HELIUM 35.4 Megapixel CMOS	GEMINI 15.4 Megapixel Dual Sensitivity CMOS
EFFECTIVE PIXELS	8192 × 4320	8192 × 4320	5120 × 3000
SENSOR SIZE	40.96 mm x 21.60 mm (Diagonal: 46.31 mm)	29.90 mm x 15.77 mm (Diagonal: 33.80 mm)	30.72 mm x 18.0 mm (Diagonal: 35.61 mm)
DYNAMIC RANGE	17+ stops	16.5+ stops	16.5+ stops
MAX FRAME RATES	60 fps at 8K Full Format (8192 × 4320), 75 fps at 8K 2.4:1 (8192 × 3456) 60 fps at 7K Full Format (7168 × 3780), 75 fps at 7K 2.4:1 (7168 × 3024) 75 fps at 6K Full Format (6144 × 3240), 100 fps at 6K 2.4:1 (6144 × 2592) 96 fps at 5K Full Format (5120 × 2700), 120 fps at 5K 2.4:1 (5120 × 2160) 120 fps at 4K Full Format (4096 × 2160), 150 fps at 4K 2.4:1 (4096 × 1728) 150 fps at 3K Full Format (3072 × 1620), 200 fps at 3K 2.4:1 (3072 × 1296) 240 fps at 2K Full Format (2048 × 1080), 300 fps at 2K 2.4:1 (2048 × 864)		75 fps at 5K Full Height 1.7:1 (5120 × 3000) 96 fps at 5K Full Format (5120 × 2700) 120 fps at 5K 2.4:1 (5120 × 2160) 120 fps at 4K Full Format (4096 × 2160) 150 fps at 4K 2.4:1 (4096 × 1728) 150 fps at 3K Full Format (3072 × 1620) 200 fps at 3K 2.4:1 (3072 × 1296) 240 fps at 2K Full Format (2048 × 1080) 300 fps at 2K 2.4:1 (2048 × 864)
REDCODE SETTINGS RANGE FROM 2:1 UP TO 22:11	5:1 REDCODE for 8K Full Format (8192 × 4320) at 24 fps 12:1 REDCODE for 8K Full Format (8192 × 4320) at 60 fps 2:1 REDCODE for 5K Full Format (5120 × 2700) and 24 fps 8:1 REDCODE for 5K Full Format (5120 × 2700) and 96 fps 2:1 REDCODE for 4K Full Format (4096 × 2160) at 24 fps 3:1 REDCODE for 4K Full Format (4096 × 2160) at 60 fps		3:1 REDCODE at 5K Full Height (5120 × 3000) and 24 fps 6:1 REDCODE at 5K Full Height (5120 × 3000) and 60 fps 2:1 REDCODE at 5K Full Format (5120 × 2700) and 24 fps 8:1 REDCODE at 5K Full Format (5120 × 2700) and 96 fps 2:1 REDCODE at 4K Full Format (4096 × 2160) and 24 fps 6:1 REDCODE at 4K Full Format (4096 × 2160) and 120 fps
REDCODE RAW ACQUISITION FORMATS	8K Full Format (8192 × 4320), 2:1, 2.4:1, 16:9, 14:9, 8:9, 3:2, 6:5, 4:1, 8:1, and Anamorphic 2x, 1.3x, 1.25x 7K Full Format (7168 × 3780), 2:1, 2.4:1, 16:9, 8:9, 6:5, 4:1, 8:1, and Anamorphic 2x, 1.3x 6K Full Format (6144 × 3240), 2:1, 2.4:1, 16:9, 8:9, 3:2, 4:3, 6:5, 4:1, 8:1, and Anamorphic 2x, 1.3x, 1.25x 5K Full Format (5120 × 2700), 2:1, 2.4:1, 16:9, 8:9, 6:5, 4:1, 8:1, and Anamorphic 2x, 1.3x 4K Full Format (4096 × 2160), 2:1, 2.4:1, 16:9, 8:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, 1:1, and Anamorphic 2x, 1.3x 3K Full Format (3072 × 1620), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Anamorphic 2x, 1.3x 2K Full Format (2048 × 1080), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Anamorphic 2x, 1.3x		5K Full Height 1.7:1 (5120 × 3000), 5K Full Height 6:5 (3600 × 3000), and Anamorphic 2x, 1.3x 5K Full Format (5120 × 2700), 2:1, 2.4:1, 16:9, 4:1, 8:1, and Anamorphic 2x, 1.3x 4K Full Format (4096 × 2160), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 3K Full Format (3072 × 1620), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 2K Full Format (2048 × 1080), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x

This is a partial list of specs. Subject to change. REDCODE values and max fps may may vary based on selected acquisition format, aspect ratio, project time base, look-around setting, and SSD. Complete details online at *red.com*

IB/E Optics SmartFinder Pro

Smartfinder Pro with RAPTOR FF Macro 60mm, both from IB/E Optics.

Rear of Smartfinder Pro and iPhone screen showing app.

Mount and groundglass.

Complete Smartfinder Pro system in its customized case.

Emma Massalone, Digital Utility on FX series, "LEGION," with SmartFinder Pro. Photograph by Chris Cavanaugh. Cinematography by Dana Gonzales, ASC. Camera package from Keslow Camera.

The Smartfinder Pro from IB/E Optics is a Director's Viewfinder for lenses ranging from Super35 to Full Format and VV variants and on through ALEXA 65mm format.

The Smartfinder Pro currently works with an iPhone. Its includes a dedicated app. In the app, you choose your camera and lens from a library of almost everything currently available.

You can capture, share, edit and save still frames and videos. Screen mirroring enables, for example, the Director to see what the DP is viewing in real time on another iOS device.

Smartfinder Pro provides GPS coordinates, a compass, and sunrise/sunset information. The entire package (including iPhone and the LPL Mount) weighs only 1 kg (2.2 lb), making it a wonderful new tool for scouting, prep, pre-viz and post.

Starting from the front, it works like this:

1. The Smartfinder Pro uses IB/E's UMS (Universal Mount System.) The kit includes ARRI LPL, XPL and PL mounts.

2. A high resolution optical groundglass sits inside the stylish housing. It is positioned 44mm behind the LPL mount's flange. At 62mm Ø image diagonal, it is even larger than an ALEXA 65 sensor (approx. 54.2mm x 26mm).

3. The image is formed on the groundglass.

4. An intermediate diffractive 4-element lens is housed between the groundglass and the iPhone's camera lens.

5. So, the iPhone is actually photographing the image on the groundglass, improved by the Smartfinder's high quality optics.

6. The handle on the right side of the Smartfinder houses a 2500mAh battery to provide the iPhone with additional hours of use. There's also an accessory 5 Volt USB socket.

7. The Smartfinder app displays framelines, surround view, focal length, aperture, angle of view, sensor size and resolution, aspect ratio, depth of field and distance. It can desqueeze anamorphic images.

As Digital Cine camera and lens system introduce ever more sensor sizes and aspect ratios, including Full-Frame and even larger formats, the IB/E Optics Smartfinder Pro is an essential device on any production.

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