Jon Fauer, ASC www.fdtimes.com Sept 2016 Issue 77-78

FILM AND DIGITAL TIMES

Art, Technique, and Technology in Motion Picture Production Worldwide

Full Frame
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Angenieux Type EZ Zooms
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Tour of Sigma Lens Factory
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Transvideo StarliteRF
Hawk V-Lite 1.3x Vintage '74
Blackmagic Design DaVinci for DPs

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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Covers: A Tale of Two Cities — Full Frame Cine Lenses on Location in Hollywood and Paris

Front Cover: Steadicam Operator Aline Ballestero with Angenieux Type EZ Full Frame 45-135mm T3 Zoom, Jarred Land's personal RED 8K VV Camera, Steadicam G-50x Arm, Paralinx Arrow-X video transmitter. Model Katrina Hunter.
Photo by Yasuhiko Mikami. This is his second FDTimes cover.

Back cover: Pierre Edelmann with Full Frame Sigma 50mm T1.5 Cine Lens on RVZ's RED 8K VV Camera, with Cinematography Electronic CineTape, ARRI Wireless Focus system.
Photo by Pauline Maillet.

Full Frame is careening inexorably down the corridors of IBC like the stagecoach in the opening of *The Hateful Eight*. But a curious thing is happening. This edition of FFDTimes (Full Frame and Digital Times) is packed with a plethora of Full Frame cine lenses. But there's a perplexing paucity of Full Frame cine cameras. What's going on here? Why is the cart before the horse?

Full Frame is 24x36mm image area, the same worldwide standard familiar to still photographers since Oskar Barnack took 18x24mm (actually 18.66 x 24.89mm) format movie film and turned it sideways. We hear a lot about VistaVision, but at 25.7 x3 7.7mm, the whisker-width difference of the frame should hardly be sufficient to set anyone into a panic.

The September cinematic triathalon begins with IBC in Amsterdam, races to Cinec and Oktoberfest in Munich, and finishes at Photokina in Cologne. With so much beer in sight and the conundrum of so many FF lenses and so few FF cameras, let's consider a fluid analogy and examine the 6 million liters of beer that will flow at Oktoberfest. Most of it will be served in one-liter mugs.

Think of the large Oktoberfest mug, called Maß, as a Full Frame camera sensor. The beer is your lens. A Maß filled to the top is a Full Frame camera with a Full Frame lens. Oh, I can hear the protests from our rental house friends amid the Oktoberfest din, "But why do we need cameras with a new Full Frame format that will make our huge inventory of S35 PL-mount lenses obsolete?"

Hardly obsolete. The answer is in the Maß. It can be full, but doesn't have to be. All those S35 lenses in your inventory are like beer mugs filled half way. The beer doesn't spill and the lenses still fit. A 50mm S35 lens on a Full Frame camera is always a 50mm lens. The unused peripheral area beyond S35 is simply windowed in camera or cropped in post. And what about a Full Frame lens on all those S35 cameras? Better still. FF lenses are future-proof—fitting S35 and ready for the inevitable next wave of FF cameras.

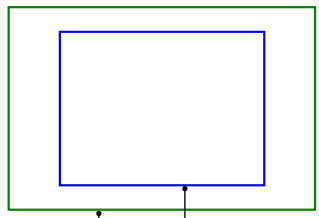
This September, there are new FF Zooms from Angenieux, FF Zooms and Primes from Sigma, FF Leica M 0.8 lenses, additional Schneider Xenon FF primes, and ZEISS Milvus FF primes with ZEISS Lens Gears. They join the estimated 200 million FF still lenses and the existing inventory of successful FF cine lenses. ZEISS came out with the first FF Compact Primes in April 2009, and CP.2 lenses with interchangeable mounts in April 2010. The first ZEISS FF CZ.2 zoom arrived April 2012. Canon Cinema EOS FF primes came in mid 2013. In 2014, Sony had a 28-135 FF zoom for a7 and E-mount cameras.

With all these choices, mounts are becoming agnostic. Therefore, almost every manufacturer is now fitting their lenses with interchangeable mounts: EF, F, PL, E-mount, and mounts not yet off the drawing boards. Cooke introduces Multi Mounts this month.

Super35 is not going away. Canon C700 and Panasonic VariCam Pure are new S35 cine cameras. ARRI ships Alexa SXT and Sony's ASX-R7 Recorder adds features for F5 and F55. ZEISS has a new, affordable S35 zoom. Fujinon is shipping the affordable 20-120 T3.5. Affordable Angenieux Type EZ FF zooms convert to S35 by swapping the rear group. These new lenses address the big market for corporate, streaming, industrial, institutional and independent production that's booming with a growth rate estimated at 30% per year. And the aspirational high-end continues to flourish.

With so many Full Frame lenses, and only a couple of cameras to accommodate them for high-end cinema, surely it's only a matter of months before others will respond. Because most cinematographers and Oktoberfest revelers share one common desire. They never saw a larger glass, larger sensor or larger format that they did not want to fill up.

Full Frame and S35



Quite a Few Full Frame Lenses at IBC 2016

Sony FE PZ 28-135 f/4 G OSS E-mount FF zoom

Angénieux Type EZ FF 45-135 T3 and FF 22-60 T3

Sigma FF Cine 24-35 T2; 20, 24, 35, 50 and 85 T1.5

Schneider Xenon FF 18, 25, 35, 50, 75, 100, 135 T2.1

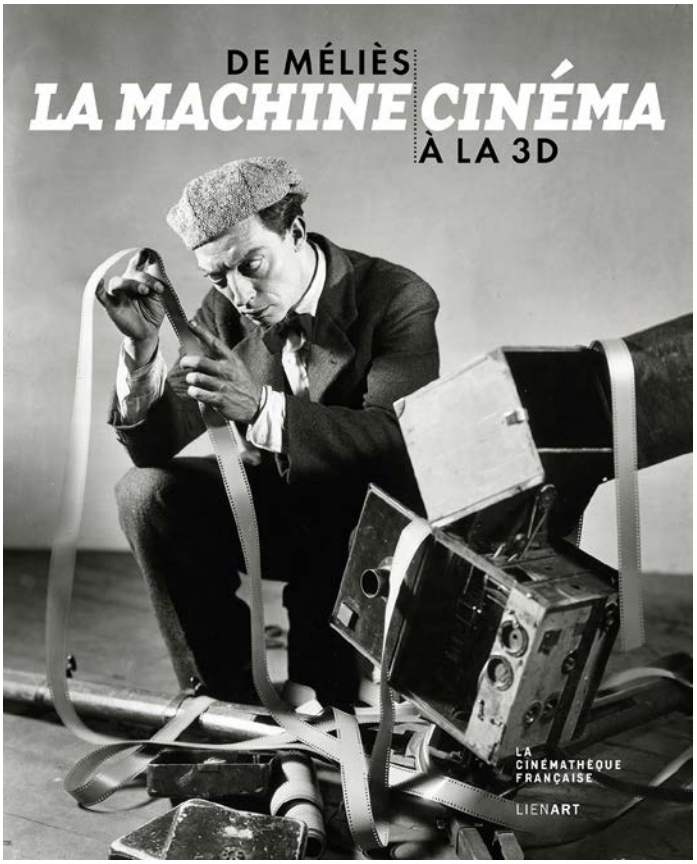
Leica M 0.8 21 f/1.4, f/1.4, 28 f/1.4, 35 f/1.4, 50 f/0.95

Canon EF Cinema CN-E 14, 24, 35, 50, 85, 135

ZEISS Milvus 15, 18, 21, 35, 50, 50M, 85, 100M, 135

ZEISS CP.2 15, 18, 21, 25, 28, 35, 50, 50M, 85, 100, 135

ZEISS CZ.2 15-30, 28-80, 70-200



La Cinémathèque française in Paris will exhibit "From Méliès to 3D: the Machines of Cinema" from Oct 5, 2016 - Jan 29, 2017.

Laurent Mannoni, Director and Conservator of the Cinematheque, curated the exhibition and wrote the wonderfully informative accompanying book. *(Coedition Lienart / The French Cinematheque. 304 pages, 350 illustrations, October 2016.)* Laurent looks after the Cinematheque's vast collection, by far the best in the world, in an annex normally open by invitation only.

Now the Cinematheque puts on display more than 250 historically significant "machines" that made moving pictures. The machines' combined weight is 10 tons. Laurent's book is lighter. He writes, "This book is intended as a path in the long history of cinematic techniques through the collection of the French Cinematheque and important milestones from the eighteenth century to the present. It shows the almost Darwinian progress of filmmaking.

"The challenge of the exhibition and this accompanying book is to remember that cinema is a highly technical art, much more than all the other arts. We want to understand how technology creates new forms, and conversely, how the desire to create original images gives birth to new devices, systems or processes. Cinema is born from the union of science and invention, continuously improved thereafter through the combined efforts of artists, technicians, physicists, opticians, chemists, biomechanics, and computers."

The waypoints of this exhibition follow the birth of cinema (late 19th century), Talkies (1927), Technicolor (1932), CinemaScope (1953), Large Format 70 mm (1955), the New Wave (1950), to the present. The exhibition has unique equipment on display: the first cameras used by Marey, Lumière and Méliès, the classic Technicolor cameras of Hollywood, Jean-Luc Godard's handheld 35 mm 8/35 Aaton, and the underwater housing from *Oceans*.

Many of our familiar friends are here: an Angenieux - Franscope anamorphic zoom lens (1958), the Louma (1970) from Jean-Marie Lavalou and Alain Masseron, Garrett Brown's Steadicam (1974), ARRI's 35BL from *Raging Bull* (1980), a Super Panavision Silent Reflex (1983) and Platinum Handheld camera (1986), Jacques Delacoux's first Transvideo monitors (1985), Howard Preston's Light Ranger (1990) — a giant ancestor of his latest, graceful LR2 that guides distance measurements and enables autofocus.

Le Cinéma Numérique begins for Laurent in 1995 with Danish Dogma films and Anthony Dod Mantle's work with Sony prosumer DV cameras that awed critics at Cannes. Lucas follows with a Sony F900 on *Star Wars II* (2002), Panavision with their Genesis camera (2005), RED One in 2007 and Stephen Soderbergh's RED Epic on *Che* (2008).

The digital doyennes are here: ARRI's Alexa (2010) and Aaton's Penelope Delta (2012). But Laurent is not a fusty academic pining for the long-lost days of Cinéma Argentique. He writes, "The choice of equipment is crucial for a film. Orson Welles and Gregg Toland used one of the first non-bulky, quiet cameras—Mitchell BNC—on *Citizen Kane* (1941). On *Body and Soul* (1947), James Wong Howe, wearing roller skates, performed virtuoso moves for a boxing match, using the small 35mm Bell & Howell Eyemo, with its spring motor and typically used by war reporters. Final aesthetic deeply depends on the choice of tools.

"Each filmmaker has a different relationship with the technique, and it's fascinating to study. If the New Wave revolutionized cinema, thanks to inventive cinematographers like Raoul Coutard, it also benefited from a new generation of lighter handheld cameras and technology." The new wave crossed the Atlantic. Like a moth circling a flame, Haskell Wexler captured the searing drama of *Virginia Woolf* hand-holding an Eclair CM3.

"Digital technology offers the cinema incredible results. However, some filmmakers do not agree. They prefer the vibration of silver grains to static pixels. It is true that digital is subject to rapid obsolescence. Try to operate today the first professional digital cameras or the first digital projectors that appeared in France in the late 1990s. The software has disappeared, components are no longer made, the computer stops responding.

"On the other hand, a Lumière Cinématographe from 1895, with its old mechanism, its claws, its ribbons of film, still works today. All one has to do is simply turn on the lamp, turn the crank, and images magically dance upon the white wall in a darkened room. This is perhaps the most beautiful lesson we learned from Louis Lumière: the timeless power of cinematography and the memorable legacy of the Cinématographe confront the virtuality and volatility of digital.

"Let us trust in the future. Cinema offers an eclectic mixture of technology and artistic sensibility that often allows the production of major and surprising works. Digital, even with its volatility and propensity to devour everything, opens up exciting prospects. What matters is that the cinema, the writing of movement, born in prehistoric caves, remains very much alive as an art today. The cinema, as Abel Gance said, must always be reinvented."

(Translated from Laurent's French manuscript by Jon Fauer)

Angénieux Goes Full Frame Easily

Angénieux Type EZ-1 in
FF format with PL Mount

Angénieux Type EZ-1 in
S35 format with PL Mount

Here are two new, convertible, compact zooms from Thales Angenieux. They cover both Super35 and Full Frame/VistaVision. Their small size and light weight seem to defy physics. (Aren't Full Frame lenses supposed to be at least 1.5 to 2 times the size and weight of their S35 counterparts? Not these.) The price defies tradition. This is a new paradigm for Angenieux: an affordable zoom lens filling the gap between the DSLR and Cinema lenses for the growing corporate, documentary and owner-operator markets.

AT IBC, Angenieux debuts the first two models. Type EZ-1 is a standard 3x zoom. Type EZ-2 is a wide-angle 2.7x zoom. Both lenses have exchangeable rear lens groups and hence the ability to be swapped between Super35mm format (up to 30mm image diagonal) and Full Fframe/VistaVision (up to 46mm image diagonal).

The Angenieux EZ-1 covers a standard zoom range. It is slightly longer than a classic Angenieux Optimo 28-76 or Style 30-76. With the Super35 Rear Group attached, the EZ-1 is a 30-90mm T2 zoom. With the FF Rear Lens Group, it is a 45-135mm T3 zoom.

The Angenieux EZ-2 covers wide angles. It is just a little bit longer than a classic Angenieux Optimo 15-40. When configured for Super 35, it is a 15-40mm T2 zoom. Configured for FF/VV, it becomes a 22-60mm T3 zoom.

How can they do this? Angenieux has been building zoom lenses for 60 years—since 1956. They have a great deal of optical and mechanical design experience making compact and lightweight lenses. The concept of interchangeable rear groups is not new at Angenieux. The 44-440 T4.5 Anamorphic Zoom introduced in April 2016 has been a great success with rental companies because of its high quality and interchangeable rear group that can be swapped to convert it to a 25-250 T3.5 Optimo Style Spherical zoom.

In 2012, Angenieux introduced the 19.5-94 T2.6 and 28-340 T3.2 with 31.4mm image diagonal coverage. These zooms featured not only new rear groups but also a redesign of the ever-popular 24-290 T2.8 and 17-80 T2.2 which had smaller image diagonals.

The technology of "speed boost" by reducing image coverage is at work in the new EZ series. Apertures normally unheard of in a Super 35 zoom lens are achieved: T2.0. Actually, apertures unheard of in a Full Frame / VV zoom are also achieved: T3.0 — in a size and weight that leaves us astonished.

Both lenses have a full metal mechanical barrel, with internal thermal drift compensation. In other words, your focus remains constant as temperatures on location fluctuate. You may have to shed layers of clothing as the thermometer rises, but the lens maintains its parameters.

Focus, iris, and zoom rings have familiar wide rotation and industry-standard 0.8M gear teeth. The lens length remains constant because focus and zoom mechanisms are internal. You can configure the lenses for S35 and FF/VV formats by swapping the rear group yourself. EZ Zooms come with PL mounts and you can attach EF or E mounts without returning the lens to a service center.

"It is important for Angenieux to address the ever-growing market of affordable digital motion picture cameras," said Pierre Andurand, CEO of Thales Angenieux. "The challenge is to provide a cost-efficient, professional quality lens that can be used on current S35 cameras, as well as on future cameras that will be built around larger image sensors."

EZ-1 deliveries are expected in the 1st quarter of 2017. EZ-2 should deliver in the 2nd quarter of 2017. Band Pro is the distributor in the Americas, Jebsen in Asia/Pacific, Angenieux France in Europe and rest of the world, and there will be a network of resellers. Prototype lenses will be shown at IBC 2016 in the Thales Angenieux and Band Pro booths.

angenieux.com bandpro.com jebsenindustrial.com

Angénieux Type EZ Zoom Comparisons

EZ-1 S35 30-90

Type EZ-1 Super35
30-90mm T2
Zoom Ratio: 3x
Image Diagonal: 30mm
Aperture: T2.0 - 22
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 226 mm / 8.9"
Wgt: 2.15 kg / 4.7 lb

EZ-1 FF 45-135

Type EZ-1 FF / VistaVison
45-135mm T3
Zoom Ratio: 3x
Image Diagonal: 46mm
Aperture: T3.0 - 32
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 226 mm / 8.9"
Wgt: 2.05 kg / 4.5 lb

EZ-2 S35 15-40

Type EZ-2 Super35
15 - 40mm T2
Zoom Ratio: 2.7x
Image Diagonal: 30mm
Aperture: T2.0 - 22
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 210mm / 8.3"
Wgt: 2.12 kg / 4.7 lb

EZ-2 FF 22-60

Type EZ-2 FF / VistaVison
22 - 60mm T3
Zoom Ratio: 2.7x
Image Diagonal: 46mm
Aperture: T3.0 - 32
MOD: 0.6m / 2'
Front Diam: 114mm
Length: 210 mm / 8.3"
Wgt: 2.07 kg / 4.6 lb

Photos in this article and on cover by Yasuhiko Mikami

Leica M 0.8 Full Frame Lenses

Leica M 0.8 50mm f/0.95 Noctilux on RED 8K VV Camera

RED 8K VV / FF Camera

RED 8K VV has a 35.4 megapixel sensor that can capture 8K at a 2.4:1 aspect ratio up to 75 fps and 8K Full Frame up to 60 fps.

Effective Pixels:	8192 x 4320
Sensor Size:	40.96 mm x 21.60 mm
Maximum Diagonal:	46.31 mm

REDCODE RAW Max Frame Rates & Resolution

60 fps at 8K Full Frame (8192 x 4320)
75 fps at 8K 2.4:1 (8192 x 3456)
60 fps at 7K Full Frame (7168 x 3780
75 fps at 7K 2.4:1 (7168 x 3024)
75 fps at 6K Full Frame (6144 x 3240)
100 fps at 6K 2.4:1 (6144 x 2592)
96 fps at 5K Full Frame (5120 x 2700)
120 fps at 5K 2.4:1 (5120 x 2160)
120 fps at 4K Full Frame (4096 x 2160)
150 fps at 4K 2.4:1 (4096 x 1728)
etc.

Leica M 0.8 Series

	21mm	24mm	28mm	35mm	50mm
Aperture	f/1.4	f/1.4	f/1.4	f/1.4	f/0.95
Weight (g)	580	500	440	320	700
Weight (lb)	1.3	1.1	1.0	0.7	1.5
Length (cm)	7.7	7.7	8.1	5.8	7.5
Length (in)	3.0	3.0	3.2	2.3	2.9
Close Focus (m)	0.7	0.7	0.7	0.7	1
Close Focus (ft)	2.3	2.3	2.3	2.3	3.3
Screw-in Filter	Series VIII	Series VII	E49	E46	E60
Image Circle	Full Frame				
Lens Mount	Leica M				

Prelimary specs, subject to change

Leica M 0.8 Summilux 21mm f/1.4

Leica M 0.8 Summilux 24mm f/1.4

Leica M 0.8 Summilux 28mm f/1.4

Leica M 0.8 Summilux 35mm f/1.4

Leica M 0.8 Noctilux 50mm f/0.95

Leica M 0.8 Full Frame Lenses

RED 8K VV Camera

Leica OLPF for RED Camera

Leica M 0.8 Summilux 28mm f/1.4 on RED Dragon 8K VistaVision Camera

Leica M 0.8 Summilux 35mm f/1.4 on RED Dragon 8K VistaVision Camera

Canon Cinema EOS C700

This is the camera that many have dreamed Canon would build. They did. Canon presents Cinema EOS C700 at IBC 2016.

The new EOS C700 is a Super35 format studio and shoulder-resting camera with internal 4K ProRes and XF-AVC as well as integrated Codex uncompressed RAW recording. There is a choice of two lens mounts, PL or EF mount—and a choice of Global Shutter or Standard CMOS sensor. Pixel size is 6.4 x 6.4 µm. Depending on model and mode, effective image area is 26.2 x 13.8mm (29.6 mm diagonal) when shooting 4K and 28.9 x 15.2 (32.6mm diagonal) in RAW 4.5K.

Brief history

Canon launched the first Cinema EOS C300 on the stage of the Paramount Theater in Hollywood on November 3, 2011—five years ago. That was the "beginning of a new relationship" for Canon in Hollywood. It was their first professional 35mm digital cine camera. In a presentation, Masaya Maeda, Senior Managing Director, drew the outline of a pyramid. Consumer, prosumer and DSLR cameras occupied the base. The C300 was shown in the middle. The top of the pyramid, representing the pinnacle of digital motion picture production, was empty. We asked when the top would be filled. Mr. Maeda said modestly, "We are still learning. We'd like to begin a dialog with the community here in Hollywood to better understand the expectations of the industry and where we should go."

The next five years were a remarkable success story. Cinema EOS cameras appeared on sets and locations worldwide. The look, low-light capabilities, medium-format shape, EF mount, quality and usability was appealing to cinematographers and rental houses.

Five months after the C300 was shown at NAB 2012, Canon introduced the 4K EOS C500. Another 5 months later, at IBC 2012 in Amsterdam, Canon showed the EOS C100 camera. Then, in April 2015 at NAB, Canon presented the C300 Mk II with internal 4K recording to CFast 2.0 cards and 15 stops of dynamic range.

More than 40,000 Cinema EOS cameras have been shipped worldwide. EF mounts account for about 90 percent of the C300 market. On the C500, it's a 50/50 split between EF and PL.

Canon's C700 climbs higher in Mr. Maeda's pyramid. It is a rugged and expandable high-end camera system for all segments of the industry.

The EOS C700 EF and EOS C700 PL will ship in December at a list price of $35,000.

The EOS C700 GS PL will ship in January 2017 with a list price of $38,000.

C700 overview

The C700 is modular. The rugged magnesium body is similar in size to another popular camera and about half the weight (approximately 7.9 lb for the EOS C700 PL and EOS C700 GS PL Main Body). The styling is distinctly Canon. Rounded edges and semi-circular sides behind the lens mount hint at the Canon C300 design legacy. Whereas the C300 has a medium format heritage, the C700 will be equally comfortable handheld, shoulder-resting, on a head, Steadicam, gimbal rig or rigged to a car mount.

There are enough 3/8-16 and 1/4-20 threaded holes on the top and bottom to satisfy the most demanding cheese-plate and accessory obsessed camera crews. The top handle attaches with two screws in a plethora of positions for perfect balance. Focus tape hooks adorn both left and right sides. Clearly, the designers at Canon listened to the requests of camera crews.

The shoulder pad consists of two sections that adjust to fit the width of any camera operator's shoulder. It has industry-standard Hirth tooth rosettes on each side and sockets with 15mm rods in front. The camera comes with a standard rear V-lock battery mount. An Anton Bauer Gold Mount adapter could be used, but may not send battery status information to the camera's EVF.

Standard CMOS sensor and GS Models

C700 comes in three models

- EOS C700 EF — EF mount with standard CMOS sensor
- EOS C700 PL — PL mount with standard CMOS sensor
- EOS C700 PL GS — PL mount with global shutter sensor

If you have your heart set on a C700 EF GS, you might buy a C700 PL GS and ask a Canon service center to swap the mount.

Quick review. Global shutter is electronic, not mechanical, where the image is captured in a single moment by every pixel on the sensor. A standard CMOS captures the image by scanning the scene from top to bottom. Depending on the speed of the scan, a standard sensor (sometimes called rolling shutter) may result in the dreaded "jello" effect where a straight tennis racquet appears curved in mid stroke or a helicopter's rotating blades look rubbery. A standard sensor may also result in "flash band" effect, which is partial exposure of the frame. For example, photographers' strobes at a rock concert may result in half of your frame being black.

Canon C700 standard CMOS models have 15 stops of dynamic range. They provide dual-pixel autofocus capability when autofocus lenses are used. Standard CMOS sensor models have more dynamic range, autofocus and are expected to ship sooner.

Because of the extra processing power that goes into exposing the entire sensor at one time, Global Shutter (GS) models lose a little dynamic range. They have 14 stops of exposure latitude. They are slightly more expensive and will ship a little later. Global shutter models are helpful for sports, fast action, concerts and events where jello and flash band effects are undesirable. Having said that, processing speed is extremely fast because the C700's CMOS sensor outputs to three DIGIC 5 Digital Imaging Integrated Circuits.

Lens mounts

The Canon Cinema Lock EF mount is the same ruggedized version first seen on the C300 Mk II. Flange focal depth is the usual 44 mm. Inside diameter within the lens cavity is 54 mm. A Mitchell/PL/Panavision style locking ring secures the lens in place when you rotate the tabs clockwise (clock to lock). You do not twist the lens itself as you would on a Canon DSLR. The EF mount has Canon's familiar gold-plated lens data and power pins.

The PL mount has a typical flange depth of 52 mm. The inside diameter is the same as EF: 54 mm. The C700's PL mount is fitted with Cooke /i lens metadata and power pins.

Codex Integrated Recorder

With a Codex CDX-36150 attached, the C700 will record uncompressed 10-bit or 12-bit 4K RAW up to 120 fps and 2K ProRes up to 240 fps. The Codex CDX-36150 is made specifically for the C700 and attaches to the rear of the camera. It is smaller and lighter because it uses the C700's menus and controls.

The battery plate that comes with the camera is removed, revealing a multi-pin connector. The Codex attaches securely there. Codex will offer 2 models of the recorder so users can order with either V-Lock or Anton Bauer Gold Mount.

You use a Codex Capture Drive 2.0 (1 TB or 2 TB capacity), the same familiar media used in Alexa and VariCam35. The CDX-36150 could democratize RAW recording with its affordable price around $6,000 and industry-standard media.

EVF

The C700 has a crisp 1920x1080 OLED Viewfinder (EVF-V70). Although sold separately, it is an essential accessory in the camera package and something no C700 user should be without. The OLED Electronic Viewfinder has an HDR simulated picture with a "stretched" dynamic range for increased shadow detail and highlight retention. This is accomplished without the requisite increase in brightness of true HDR.

Because C700 and C700 PL sensors have 4622 x 2496 pixels, surround view in the viewfinder can be available. Encroaching microphone booms at the top of frame are easy to see. Masks and framelines are user adjustable. When moving away from the eyepiece, the viewfinder helpfully dims but doesn't turn off. Furthermore, the EVF will not burn out when exposed to direct sun.

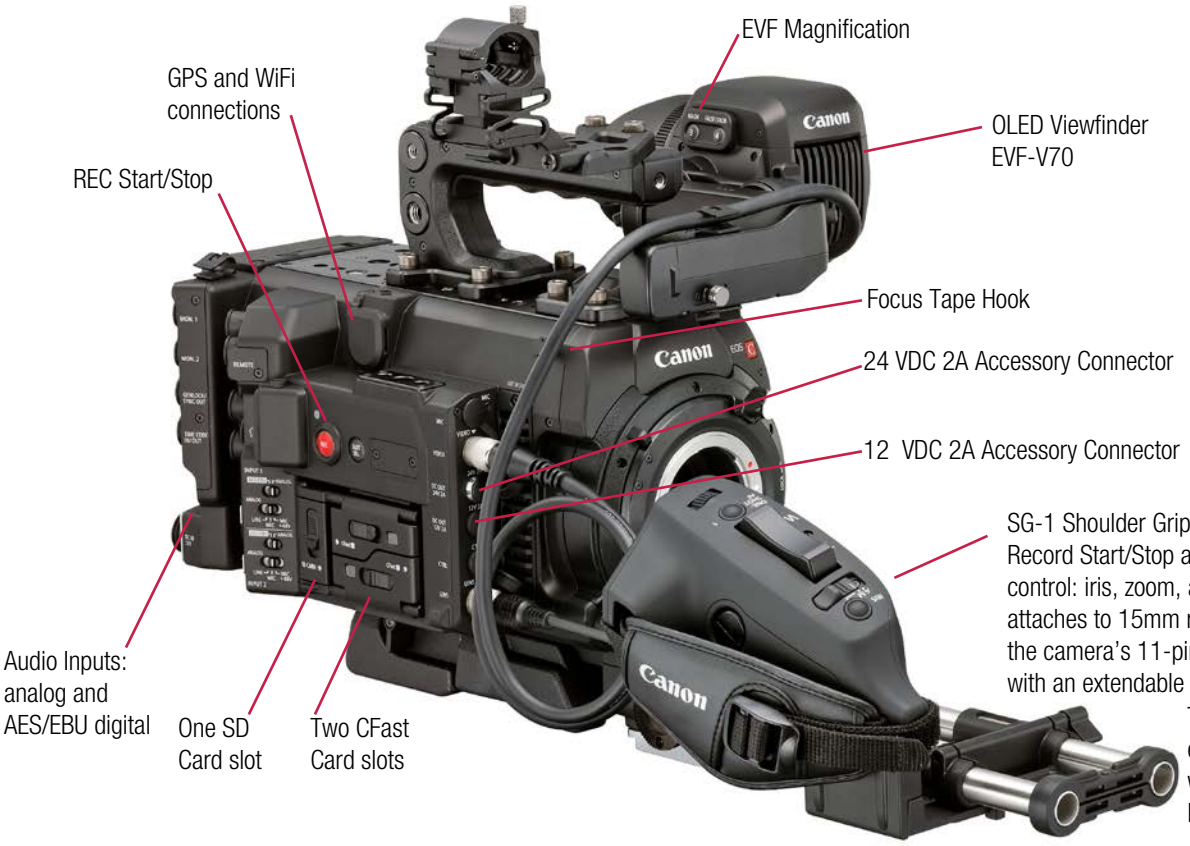
Anamorphic

C700 supports anamorphic format lenses by electronically desqueezing the image in the viewfinder and on connected monitors. You can take advantage of the camera's full 4K resolution by using 1.3x squeeze anamorphic lenses.

Popular 2x squeeze anamorphic lenses cover a native 1.2:1 aspect ratio on the sensor. That translates to an actual resolution of 2592 x 2160 pixels. This squeezed "window" can be repositioned left or right in post if, for example, you see a previously undetected, errant C-Stand lurking on the right side of frame.

Canon Cinema EOS C700 Modular System

Canon Cinema EOS C700 Modular System



Panasonic+Codex VariCam Pure

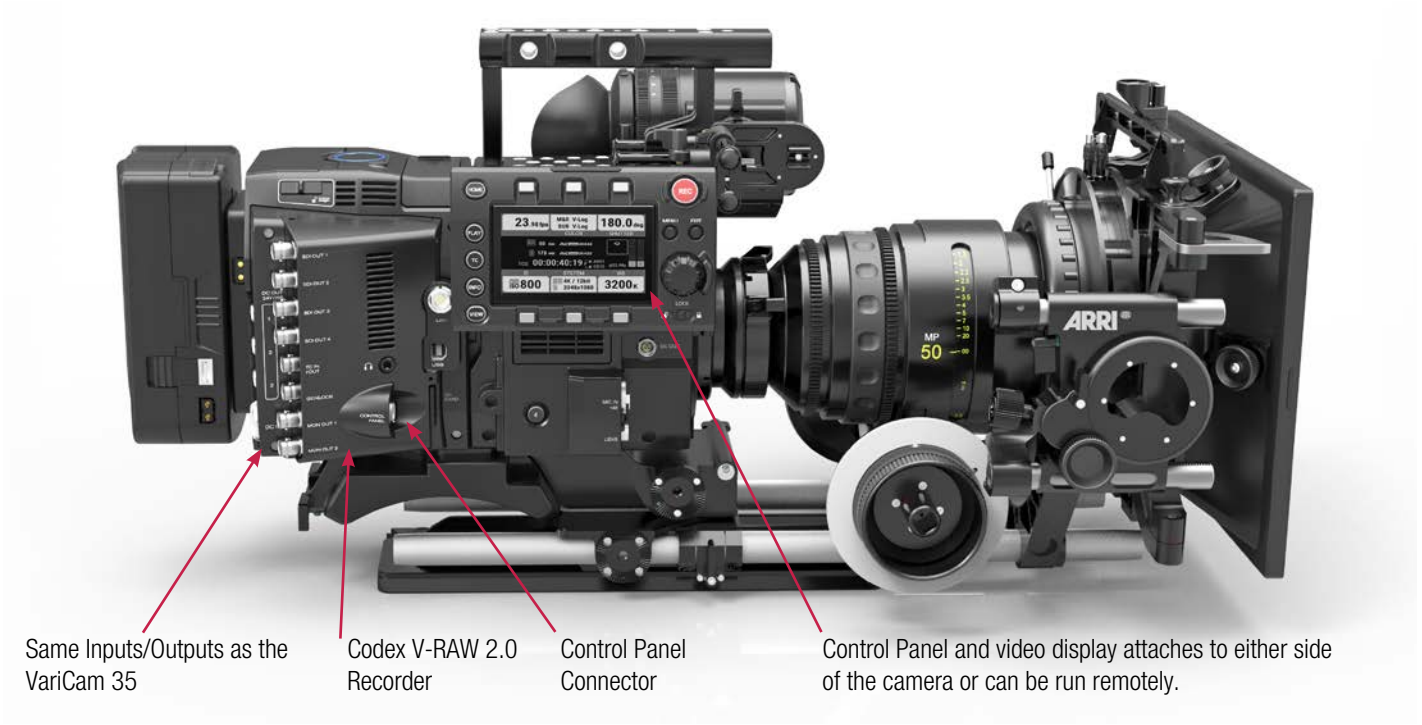
At IBC 2016, Panasonic introduces the VariCam Pure. It is a "co-production" between Panasonic and Codex.

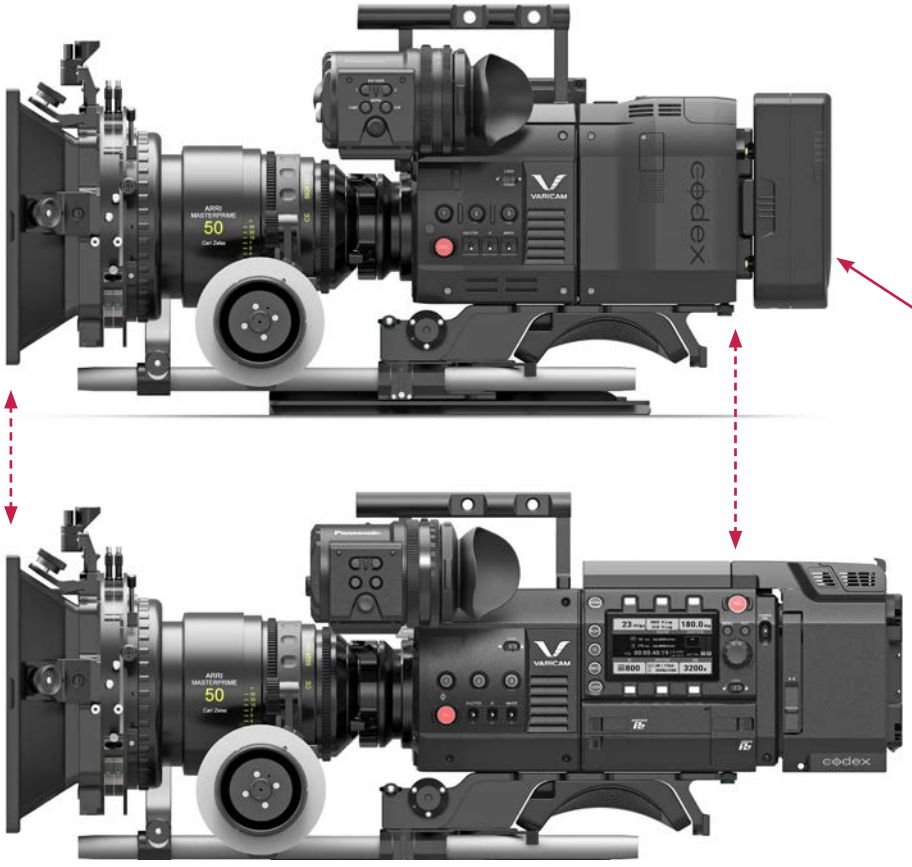
VariCam Pure is a new S35 4K/2K camera system with high-quality imaging, 14+ stops of dynamic range, dual ISO 800/5000, and built-in, uncompressed RAW to 120 fps.

The new VariCam Pure camera records pure, uncompressed RAW up to 120 fps onto familiar, industry-standard Codex Capture Drive 2.0 media already widely used by many camera systems, post facilities and studios.

VariCam Pure is rugged, compact, lightweight (5 kg total) and ergonomic. The Codex RAW Recorder is integrated with the camera.

Menus and controls of both the camera and the Codex are managed by the camera's flexible control panel and video display. It attaches to either side of the camera or can be run remotely.





VariCam Pure

Same Camera Head as VariCam 35. The Recording Body is replaced by the Codex V-RAW 2.0 Recorder. The combined size and weight is significantly reduced.

VariCam 35

Camera Head and Recording Body and optional Codex V-RAW Recorder

Kunihiko Miyagi and Marc Dando on VariCam Pure

This discussion of VariCam Pure has a structure reminiscent of Rashomon. The difference is that both protagonists are in full agreement with each other. Kunihiko Miyagi is Director of Panasonic's Professional Video Business Unit. Marc Dando is President of Codex.

Kunihiko Miyagi

Jon Fauer: Please provide an overview of the VariCam Pure. How is it different from the original VariCam 35 and LT?

Kunihiko Miyagi: We are pleased that the performance of the VariCam 35 and LT were well accepted by the market. Panasonic and Codex worked together on the RAW recorder that attaches directly to the back of the VariCam 35 camera head and the Varicam 35 AVC-Intra Recording body. However it had some limitations of mobility. Quite a few customers asked if the RAW recording capability could be made in a smaller package.

Now Codex and Panasonic propose a new RAW recording system that directly connects the existing VariCam 35 camera head module with a completely new, integrated Codex V-RAW 2.0 Recorder. It is an uncompressed RAW-only recording system, up to 120 fps. This new camera system provides better mobility because of its smaller size and lighter weight.

It is called VariCam Pure. The name suggests the purity of uncompressed RAW recording that enables the best picture quality.

When did the project begin?

Marc Dando and I got this idea at NAB2016. We started the co-development project in June of this year. The engineers of both companies worked very hard to achieve this in only 6 months.

My understanding is that RAW recording amounts to about 10% of the high-end market. Will this camera make RAW more affordable and popular?

Yes, we believe so. The AVC-Intra 4K recording of the current VariCam 35 offers high quality video, capturing 14+ stops of dynamic range, all with a reasonable file size and fast workflow. It has been widely used in episodic dramas by major content providers such as Netflix. On the other hand, the demand for uncompressed RAW recording is very high in the high-end market. We believe this new, pure, RAW camera-recorder system will expand the VariCam world.

Describe RAW for someone who doesn't know much about it.

RAW recording captures the maximum possible image quality from the sensor. It allows for flexibility in post production and color grading to achieve the best possible color reproduction.

The VariCam Pure system utilizes the Camera module and the new V-RAW recorder to achieve this quality of 14+ stops latitude up to 120 fps. The Codex RAW workflow is well established in this industry and so this is a natural step for both companies.

Do you want to tell us about delivery dates and prices?

Delivery will be end of 2016. Prices will be announced at IBC.

In summary?

The original modular concept of the VariCam 35 enabled this project to be realized. We believe that the combination of Panasonic's camera technology and Codex's RAW recording and workflow expertise will create an excellent synergy for future developments.

Marc Dando

Marc, what is the concept of this new camera?

Marc Dando: Meeting with customers around the world, we often heard that they loved the image quality of the VariCam 35, wanted RAW recording, but needed a smaller camera system that could be used in all situations—from an A camera on a dolly to a Steadicam or on a remote head. We knew that we could work together with Panasonic and improve the ergonomics and usability of the system.

Will this camera increase the use of RAW recording?

RAW has become the standard for many feature films and Codex is fortunate to have been at the forefront of the transition. Now that more and more consumers are expecting higher quality in the home, studios like Netflix would like 4K RAW acquisition so that they can meet the expectations of their current customers and also future-proof their content— for example, for HDR distribution.

What are the advantages of shooting RAW?

RAW is uncompressed and unprocessed. It's the pure image data collected by the sensor. For today, it means you have maximum flexibility in processing and color grading the images. And for tomorrow, it means that as image processing algorithms improve, you can meet the needs of future distribution formats and get the maximum value out of your archive.

But isn't it harder to deal with in post?

No. Facilities are now very used to dealing with RAW files. They understand the huge advantages for grading, VFX and archiving. Many people are surprised to find out that RAW files often are not that much larger than, for example, high quality ProRes files. The Codex system, from recording through completion, allows users to make mezzanine files (digital intermediates used to make copies) before finishing from RAW, providing all the quality with the simplicity of a ProRes workflow.

Why doesn't the VariCam Pure record ProRes then?

Actually, it does that very elegantly, but not in the camera. And not only ProRes, but also DNxHR. Insert a Codex Capture Drive into a Codex Production Suite's Capture Drive 2.0 Dock to clone the RAW files, create dailies and offload to popular formats.

Conclusion?

We are very excited to work with Panasonic as we roll out this camera system together. We believe that both companies have done a great job of listening to customers and incorporating their needs. We can't wait to see the creative results that will emerge.

Sigma FF and S35 Cine Lenses

Lightweight and Compact

Sigma Cine lenses are all lightweight, compact and fast. This is quite an accomplishment for Full Frame models.

Dust-proof and splash-proof

They have the same dust-proof and splash-proof construction as the Sigma 150-600mm F5-6.3 DG OS HSM | Sports lens. Each ring and mount is sealed to help prevent water and dust from entering.

100% metal body

The body is rugged. No plastic parts.

Luminous paint

Lens designation, index lines, witness marks and scales use luminous paint to aid in changing and operating the lens in the dark.

82mm front filter

The front filter is standardized at 82mm on most models.

95mm front diameter

The front diameter of all the lenses is 95mm.

Gears

In each product line, the position of the lens gears and barrels are the same for all lenses. This saves time mounting lens motors and accessories. Each lens has an industry-standard 0.8M gear pitch.

Barrel rotation

All lenses have focus barrels that rotate 180°. Focus is guided by cams for smooth focus pulling. The zoom ring rotates 160° on all zoom lenses. The iris ring is linear—with constant distance between T-stop marks. It rotates 60°. There are no click steps.

EF, PL and E-mount

Sigma Cine Lenses are available in Canon EF mount, Sony E-mount, and PL (except 24-35mm T2.2 FF).

Mount Conversion Service

Niels Bohr said, "Prediction is very difficult, especially if it's about the future." One thing is certain: we don't know what mount the industry will settle on in its Full Frame future.

So, it's nice to know that you can change your mind about lens mounts on Sigma Cine Lenses. They have been addressing this situation for some time with their still lenses. Sigma's Mount Conversion Service will be available for the new cine lenses. Customers will be able to have their lens mounts swapped for a reasonable fee. It's a good way to future-proof one's investment in lenses.

One way to hedge your bets between EF and E-mount is to get the lens with an EF mount. Then, purchase a Sigma MC-11 MOUNT CONVERTER to use Sigma's EF mount lenses on a Sony E-mount camera body.

Electronic contacts

The EF and E-mount have electronic contacts so the lens can communicate with the camera body (focal length, focus distance, aperture, etc.)

Lens support

A removable lens support comes standard with all models.

Rollout

For the first phase, it is expected that Sigma will release two zoom lenses toward the end of 2016. Another zoom lens and 5 prime lenses will be released in 2017 onward. A Sigma executive said, "We will develop additional zoom and prime lenses, and the lens lineup will be enriched further. The latest release information will be updated on our official website (sigma-global.com)."

IBC

Sigma will have a big booth at IBC in Amsterdam and I can only imagine the number of cinematographers lining up with requests for additional lenses in their favorite focal lengths.

Sigma Cine Lens Specs

Lens	Aperture	Close Focus [1]	Image Circle	Front Diam.	Filter Size	Length		Weight [4]		Full Frame FF[5]	Super 35mm S35[6]	APS-C[7]
						EF mount[2]	E-mount[3]	EF mount	E-mount			
20mm T1.5 FF	T1.5 - 16	0.276m 11”	FF Φ43.3	95mm	-	118mm	144mm	1335g	1395g	94.5°	70.3°	70.8°
24mm T1.5 FF	T1.5 - 16	0.25 m 10”	FF Φ43.3	95mm	82mm	95mm	121mm	1125g	1185g	84.1°	60.8°	61.2°
35mm T1.5 FF	T1.5 - 16	0.30 m 1’	FF Φ43.3	95mm	82mm	95mm	121mm	1135g	1165g	63.4°	43.8°	44.2°
50mm T1.5 FF	T1.5 - 16	0.40 m 1’4”	FF Φ43.3	95mm	82mm	102mm	128mm	1295g	1355g	46.8°	31.5°	31.7°
85mm T1.5 FF	T1.5 - 16	0.85 m 2’10”	FF Φ43.3	95mm	86mm	134.5mm	160.5mm	1475g	1535g	28.6°	18.8°	18.9°
18-35mm T2 S35	T2.0 - 22	0.28 m 11”	S35 Φ28.4	95mm	82mm	129.5mm	155.5mm	1445g	1505g	-	76.1° - 43.8°	76.5° - 44.2°
50-100mm T2 S35	T2.0 - 22	0.95 m 3’2”	S35 Φ28.4	95mm	82mm	175.2mm	201.2mm	1885g	1945g	-	31.5° - 16.0°	31.7° - 16.1°
24-35mm T2.2 FF	T2.2 - 22	0.28 m 11”	FF Φ43.3	95mm	82mm	122.7mm	148.7mm	1440g	1500g	84.1°- 63.4 °	60.8° - 43.8°	61.2° - 44.2°

Sigma Clne Lenses will be available in EF (Canon), E-mount (Sony), and PL (all except 24-35mm T2.2 Full Frame Zoom)

1. Close focus distance is measured from the image plane
2. Front to EF mount flange
3. Front to E-mount flange
4. Without lens support foot
5. Horizontal angle of view for a full-frame camera aperture (aspect ratio 1:1.5,dimensions 36 mm x 24 mm / 1.42“ x 0.94“)
6. Horizontal angle of view for a super 35 digital cinema camera aperture (aspect ratio 1:1.8,dimensions 24.6 mm x 13.8 mm / 0.97“ x 0.54“)
7. Horizontal angle of view for an APS-C camera aperture (aspect ratio 1:1.5,dimensions 23.7 mm x 15.7 mm / 0.93“ x 0.62“)

Specifications are subject to change

Jon Fauer, ASC www.fdtimes.com Sept 2016 Issue 77-78

FILM AND DIGITAL TIMES

Art, Technique, and Technology in Motion Picture Production Worldwide

Full Frame
Sigma Cine Lenses
Tour of Sigma Lens Factory
Leica M 0.8 Primes
Angenieux Type EZ Zooms
ZEISS Milvus Primes
RED 8K VV Camera
IB/E Raptor Macros

New Cameras
Canon Cinema EOS C700
Panasonic+Codex VariCam Pure
ARRI Alexa SXT
Sony AXS-R7 Recorder

New Lenses, Lights, AKS
Cooke Classic Panchros
ZEISS LWZ.3
Fujinon 20-120
Teradek Bolt 1000 + 3000
ARRI Master Grips
ARRI S-120-C SkyPanel
Cartoni Lambda Heads
Transvideo StarliteRF
Hawk V-Lite 1.3x Vintage '74
Blackmagic Design DaVinci for DPs