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Sony Special

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New Sony PXW-FS7 II Special Report



Sarah Fishbein with Sony FS7 II
photo by Chuck Fishbein

Sony PXW-FS7 II



Sony introduces the PXW-FS7 II this November, just in time for InterBEE 2017. The successful *cinéma vérité* FS7 will remain in Sony's lineup. However, the FS7 II is the model you'll want for its new Lever Lock E-mount, In-Camera Electronic Variable ND, versatile viewfinder, smarter SmartGrip, and improved interface.

Lever Lock Type E-Mount

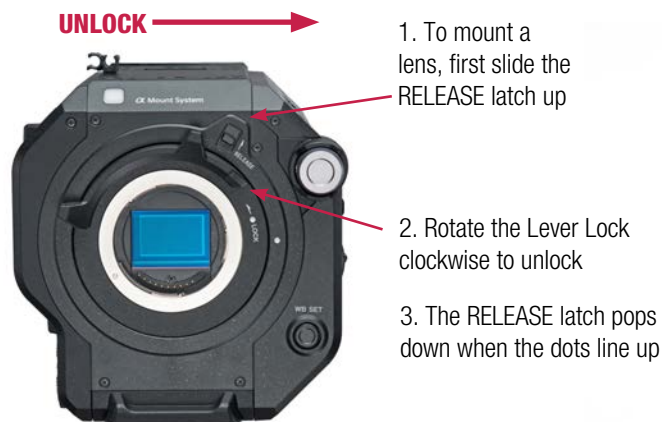
The E-mount with new Lever Lock is the most expressive example of this e-minima camera's elegant design. Imagine the familiar E-mount of previous FS or a7 series cameras. Now, instead of twisting the lens clockwise to secure it within the mount, the new Lever Lock E-mount works like an industry-standard PL, PV or Mitchell style breech lock. The only thing to remember is that the locking ring rotates counter-clockwise to tighten. Incidentally, the Canon C-700 Cinema Lock Mount tightens the same way. While this may seem counter-intuitive at first, direction is clearly marked on the camera. This was necessary because an E-mount

lens typically gets progressively tighter as you twist it clockwise.

The new Lever Lock Type E-mount is very strong, securely holding E-mount lenses and third party lens adapters. Reports indicate that the FS7 II Lever Lock Type E-Mount is as rugged as the F55 in ability to hold lenses of similar weights and without supports.

To prepare the mount, first slide the spring-loaded RELEASE safety latch upward and rotate the Lever Lock clockwise until both white dots line up. To secure an E-mount lens: line up its white dot, insert, and rotate the Lever Lock counter-clockwise until the RELEASE latch snaps downward. This prevents accidental removal. You can then tighten the ring further.

To remove the lens, slide the RELEASE latch in the direction of the arrow (up). It remains in the up position, so you don't have to keep holding it. Then, rotate the Locking Lever clockwise to open the mount and release the lens.



Sony PXW-FS7 II



Speaking of lenses, the FS7 II kit comes with the versatile 18-110 F4.0 zoom (E PZ 18–110 mm F4 G OSS). It's a Super35 format E-mount lens, without ramping (aperture does not change when zooming in) and with fully indexed mechanical focus, iris and zoom barrels. The 18-110 has a manual/servo zoom, manual/autofocus, manual/auto-iris and optical image stabilization. The lens is compact and lightweight (1.1 kg / 2.4 lb). It comes with a removable lens support, which probably can be removed for most situations short of bouncing around in cars, boats or sports.

Electronic Variable ND

The FS7 II includes Sony Variable ND technology, first introduced on the FS5. Variable ND works in 3 ways: as an essential tool, a helpful assistant, and for creative effects.

- **Essentially:** Sony Variable ND can eliminate the task of swapping ND filters in the mattebox because the light-attenuating work is done inside the camera—between the sensor and the rear of the lens.
- **Helpfully:** Have you ever dreamed of adjusting exposure without the depth-of-field altering consequence of fiddling with the iris or the motion-blur changes of shutter control? With stepless, continuously variable ND, you can adjust exposure in an exciting new way.
- **Creatively:** Variable ND works as a creative effect letting you perform depth of field shifts while maintaining constant exposure. For example, you're tight on a Samurai warrior, wide open on the lens, with a beautifully out-of-focus background. The FS7 II's Auto ND seamlessly compensates exposure as you quickly stop the lens down to T22, revealing sinister ninjas in the background, creeping into the room.

The FS7 II offers these 3 modes within a 2 to 7 stop range: Preset ND, Manual Variable ND and Auto Variable ND modes.

- **Preset** consists of Clear and 3 user-settable click-stops of neutral density: 1/4-1/128 (ND.6 - ND2.1, which is 2 - 7 stops)
- **Manual Variable ND** provides continuous control (up to 7 stops) with the camera's variable dial or the index-finger wheel of the SmartGrip. It works like an iris control on the lens, but lets you adjust exposure without changing depth of field. (You have to first turn the Preset knob to any value other than CLEAR and slide the switch to VARIABLE.)
- **Auto Variable ND** takes over exposure control automatically. It also provides a nice way to manage timelapse cinematography in extreme conditions that normally go beyond the iris limits of your lens, for example a single scene that begins on a moon-lit night and continues to bright noon the following day.

Variable ND has a number of other benefits. It lets you use telephoto catadioptric (mirror) lenses like the 500mm Nikkor, whose fixed f/8 aperture cries out for this kind of exposure adjustment. A whole world of esoteric still lenses also await because of all the E-mount to other-mount adapters. Also, you can avoid a trip to the lens repair shop if the iris is frozen wide open or you're tired of sliding aperture plates in and out of your swirly-bokeh Petzval.

Ergonomic Improvements

The FS7 II designers improved the viewfinder support system and SmartGrip arm mechanism for faster, more comfortable, documentary style camera operating. The viewfinder support bracket is stronger, and the single clamp on the FS7 has been improved with dual clamps for front-to-back and vertical height adjustments. EVF level is maintained with a new square rod system.

Sony E-mount with Lever Lock



Sony 18-110 mm F4 Zoom



E PZ 18-110 mm f/4 G OSS



FE PZ 28-135 mm f/4 G OSS

This is a good time to talk about Sony's Latest E-Mount zoom, the irresistible 18-110 "kit lens" for the FS7 II. The new E PZ 18-110 mm f/4 G OSS is a lightweight, affordable, compact zoom lens. It covers Super35 format (and APS-C for stills). With a wide end of 18 mm and a 6x zoom range, it maintains a constant aperture at all focal lengths (no ramping). The rugged magnesium-alloy body weights only 2.4 lb / 1.1 kg.

The 18-110 is Sony's second G series E-mount cine zoom, joining the full frame format FE PZ 28-135 mm f/4 G OSS Zoom. Both lenses are disruptively inexpensive and defy traditional expectations for optics of light weight, small size and good performance. The 18-110 is expected to sell for \$3,489. The 28-135 costs \$2,498.

The lens 18-110 gives you full manual, mechanical control of focus, iris and zoom. For Manual focus, slide the rubber-covered focus ring towards the camera body. For Autofocus/Manual, slide the ring towards the front of the lens and slide the FOCUS switch on the camera body to AUTO.

Unlike the 28-135 which has an electronically controlled zoom

that can lag when you change focal lengths quickly, the new 18-110 has a direct-drive mechanical zoom ring. If you want servo control, it can be engaged with the MANUAL-AUTO slide switch on the lens. Optical image stabilization is activated with another slide switch: OPTICAL STEADY SHOT ON-OFF.

Iris control can go from manual to auto by moving the aperture ring to "A" for Automatic. There's an IRIS LOCK to prevent you from accidentally setting Automatic when you want to retain Manual control, or if you want to remain in "A." There's also a CLICK ON-OFF switch on the lens for still photographers who like the familiar sound of 1/3 click stops.

The focus and iris rings have standard M0.8 gearing for lens motors and controls. Curiously, the zoom ring lacks a gear. An after-market fix like Chrosziel's Flexi Gear Ring MK II would work.

The zoom is compatible with Sony α Mount System cameras (a7 series, a6500), as well as Sony E-mount cine cameras like the FS7 II, FS7 and FS5. This lens will be excellent for cinéma vérité, handheld and documentary-style cinematography.

Sony 18-110mm F4 Zoom



- Sony E-mount
- 18 mm Flange Focal Distance
- Coverage: Super35 - APS-C
- Focal Length: 18-110mm
- Aperture: f/4 - f/22 (Probably T4.4 - T22.5)
- Circular Iris with 7 blades
- Lens Elements/Groups: 18 / 15
- One Aspherical & Two ED Elements
- Minimum Object Distance at 18 mm: 1.3' / 0.4m
at 110 mm: 2'9" / 0.9 m
- Front Filter Thread: 95mm
- Optical Image Stabilization
- Zoom Selectable Mechanical or Servo
- Focus Selectable Mechanical or Auto. M0.8 gear.
- Iris Selectable Mechanical or Auto. M0.8 gear.
- Front Diameter: 4.3" / 110 mm
- Length: 6.6" / 168 mm
- Weight: 2.4 lb / 1.1 kg (without lens support)
- Precise, smooth and quiet iris zoom and focus motors.
- Aperture can be manually changed in 1/3 stop when "Click" is engaged. Click-less and servo mode operation enable very smooth iris changes with 1/128th stop precision.
- No ramping of aperture throughout zoom range.
- The supplied sunshade has built-in louver (shutter-style) lens cap mechanism. A regular circular cap is also supplied for use when the sunshade is not used.
- Full lens metadata is transferred to the camera for display in the EVF and real-time recording onto the file (Sony formats only)
- Optimized for cine as well as stills: Parfocal, high contrast, minimal chromatic aberration, breathing or optical axis shift while zooming

Sony FS7 II

Comparison of Sony PXW-FS7 II and FS7

FS7 II has new:

- Lever Lock E-Mount
- Preset, Manually Variable and Auto Variable ND, like FS5
- 10 user-assignable buttons
- Indicator LED glows green when camera is on
- Improved EVF support and finder extender top latch
- Removable mic holder
- SmartGrip arm adjusts without tools
- Easier XQD card handling
- BT.2020 supported UHDTV 3840x2160 output via HDMI or SDI
- FS7 II price will be slightly higher than FS7 original model
- FS7 continues in the Sony lineup. Approximate US Price: \$8,499.



FS7 II



FS7



EVF top pivot is no longer a buckle: it is a solid bracket that secures the finder extender quickly and more securely

Inserts for a square rod prevent the EVF from twisting off-level

2 XQD slots: cards are easier to eject and handle

Square insert

Round insert



Inserts for square rods can be swapped for round ones



Removable mic holder



Sony FS7 II



Handgrip can be attached close to camera body



Handgrip attached in "normal" position. Front thumbscrew loosens extension arm for adjustment.



Full documentary rig: onboard mic and wireless receiver attached on top



Handgrip extension arm positioned at an angle. The handgrip rotates 280° when you push its RELEASE button.



FS7 II with Sony G Master FE 85 mm F1.4 GM Lens



FS7 II with Sony G Master FE 70-200mm f/2.8 GM OSS Lens



FS7 II with 10-18 mm E-mount Zoom



EVF can be mounted on either side of the camera. Same with microphone.

Electronically Variable Auto ND

Traditional ND

Slide the ND FILTER switch to PRESET and use the ND knurled dial to select CLEAR-1-2-3. You can select values for the 3 user-settable click-stops in MENU-CAMERA-ND FILTER and then set PRESET 1, 2 and 3 to:

Menu	ND	T Stop Equiv
1/4	ND.6	-2
1/8	ND.9	-3
1/16	ND1.2	-4
1/32	ND 1.5	-5
1/64	ND 1.8	-6
1/128	ND 2.1	-7



Manual Variable ND

Control exposure smoothly (from 2 to 7 stops) with the camera's variable dial or the index-finger wheel of the SmartGrip. This can let you adjust exposure without changing depth of field.

Tip: In MENU-SYSTEM-ASSIGNABLE DIAL, "ASSIGNABLE DIAL" is the one on the handgrip. "IRIS DIAL" is the one on the front of the camera left side, next to the ND/IRIS switch.

Here's the non-intuitive part. Even if you want to use the IRIS DIAL to continuously adjust ND, set the IRIS DIAL to "IRIS."

If you want the ASSIGNABLE DIAL on the handgrip to control ND, then you have to set it to "ND FILTER." Otherwise, leave it on IRIS, which I find more useful.

Next, on the camera body, slide the PRESET-VARIABLE switch to VARIABLE. Slide the ND-IRIS switch to ND.

Now, you're ready to perform variable ND exposure control. You must set the ND knurled knob to any position 1, 2 or 3—but not in CLEAR.

Auto Variable ND

To enable Auto Variable ND, go to MENU-SYSTEM-ASSIGNABLE BUTTON. I assigned AUTO ND FILTER to User Button 2, which is at the front of the camera left side, next to the PRESET-VARIABLE slider.

Now, push User Button 2. "A. ND" displays in the viewfinder to confirm AUTO ND. (To turn it off, push User Button 2 again.)

To control a synchronized Iris/ND pull, where the exposure remains constant but the Depth-of-Field changes, adjust your aperture—the automatic, electronically variable ND will follow.

For timelapse cinematography, go to MENU-INTERVAL RECORDING-INTERVAL REC-SETTING-ON. Then select how often you want the camera to make an exposure with INTERVAL TIME and NUMBER OF FRAMES.

Pushing RECORD will begin timelapse. After cutting, you will need to reset ON again in the menu to do another timelapse take. With AUTO ND and Auto Iris engaged, exposure is controlled automatically.



Sony FS7 II



Sony PXW-FS7 II Specs

Weight: (body with handgrip) 2.0 kg (4 lb 6.5 oz)
Dimensions: (body with handgrip) 159 mm / 6 3/8" wide
245.5 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
14.4 V DC Battery slides into rear of camera
V-Lock: V-Lock 14.4 V DC Batteries with XDCA-FS7 Extension Unit
Power Adapter: 12 VDC EIAJ connector 11 - 17 V DC
Lens mount: E-mount, Lever Lock
Exposure Latitude: 14 stops
Shutter speeds 1/3 to 1/9000 sec. (23.98P)
Shutter angles: 5.6° to 300°
Slow Motion: 1 - 60P (XAVC QFHD)
1 - 180P (XAVC HD)
White balance: Preset mode (2100K - 10,000K),
Memory mode A, B (1500K - 50,000K)
LCD monitor: 8.8 cm / 3.5" diagonal (16:9) 960 (H) × 540 (V) pixels
Media: 2 XQD card slots
1 Utility SD card slot

Connectors

Outputs: 2 SDI Video OUTPUTS BNC, 3G HD/1.5G HD
HDMI Type A, 19-pin OUTPUT
144-pin connector to attach XDCA-FS7 for RAW output
REMOTE 2.5 3-pole sub-mini (handgrip controls)
USB 2.0 type AB mini
USB Type A for W-LAN connection
EVF 40-pin connector
Inputs: 2 Audio XLR 3-pin, female LINE / MIC / MIC+48V switchable

Video Recording formats

XAVC Intra
AVC/H.264 High 4:2:2 Intra Profile
QFHD: VBR, 600 Mbps (max)
4K: VBR, 600 Mbps (max)
HD: CBG, 222 Mbps

XAVC Long
AVC/H.264 High Profile
QFHD: VBR, 150 Mbps (max), 4:2:0 Long
HD: VBR, 50 Mbps (max), 4:2:2 Long

MPEG HD 422
MPEG-2 Long GOP
HD422 mode: CBR, 50 Mbps, MPEG-2 422P@HL

ProRes 422 HQ (With XDCA-FS7 connected)
Apple ProRes 422 HQ 4:2:2, 10-bit, VBR, 220 Mbps (max)

ProRes 422 (With XDCA-FS7 connected)
Apple ProRes 422 4:2:2, 10-bit, VBR, 147 Mbps (max)

Recording frame rates

XAVC Intra
4096×2160/59.94P, 50P, 29.97P, 24P, 23.98P, 25P
3840×2160/59.94P, 50P, 29.97P, 23.98P, 25P
1920×1080/59.94P, 50P, 59.94i, 50i, 29.97P, 23.98P, 25P

XAVC Long
3840×2160/59.94P, 50P, 29.97P, 23.98P, 25P
1920×1080/59.94P, 50P, 59.94i, 50i, 29.97P, 23.98P, 25P

MPEG HD 422
1920×1080/59.94i, 50i, 29.97P, 23.98P, 25P
1280×720/59.94P, 50P, 29.97P, 23.98P, 25P

ProRes 422 HQ (With XDCA-FS7 connected)
1920×1080/59.94i, 50i, 29.97P, 25P, 23.98P

ProRes 422 (With XDCA-FS7 connected)
1920×1080/59.94i, 50i, 29.97P, 25P, 23.98P

E-Mount E-Minima Zen-Like FS7 II



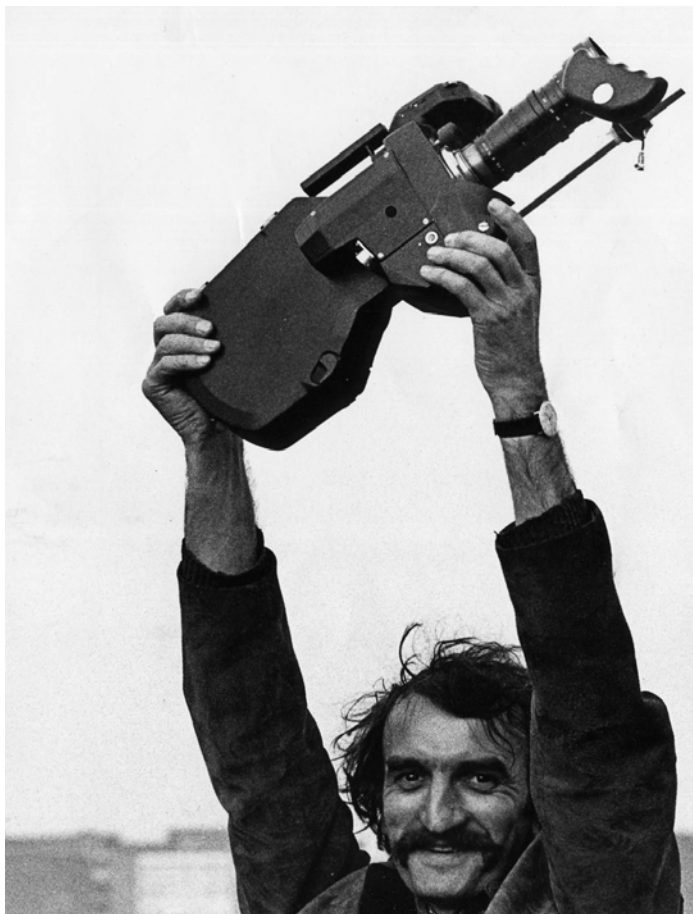
Juan Martinez (above) dreams of cameras. He is Senior Product Manager handling the FS Series camera family.

Juan describes the FS7 II: “Extensive refinements to the viewfinder support system and SmartGrip arm mechanism ensure super-fast and secure “on the run” rig repositioning—all of this while still retaining the Zen-like simplicity, flexibility and operational comfort of the FS7’s award-winning industrial design.”



The first FS7 II in the US went out with Sarah Fishbein (below) and Chuck Fishbein of Crazy Duck Productions. Clockwise from top, below left: 1. Sarah in classic cinéma vérité pose. 2. Shoulder-resting with handgrip extension low so your elbow rests comfortably on the hip. 3. Low angle, French style, tucked under arm. 4. Supported on thigh, no viewfinder extender, collapsible monitor hood; optical image stabilization in 18-110 lens helps keep picture steady when tripod is not at hand. *Photos by Chuck Fishbein.*





Jean-Pierre Beauviala and his Aaton 7LTR around 1974, with square handgrip rod and ergonomic handgrip



Albert Maysles with his Aaton, square rod mattebox handgrip, rear view mirror, lightmeter holder, and David Maysles with headphones.



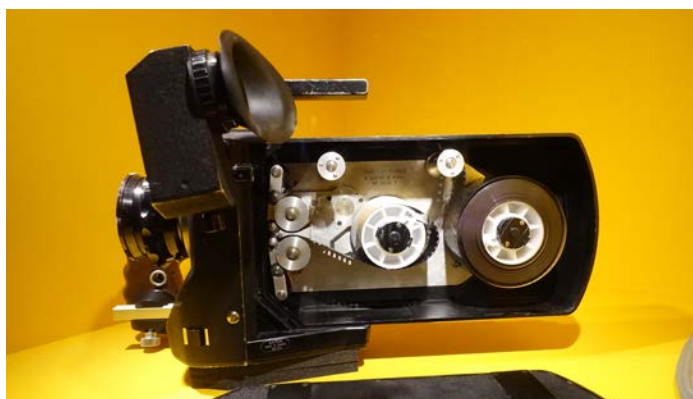
On display at the French Cinematheque: the first 16mm Aaton, 1972, serial number 1. Square rod. Aaton A-Minima S16 at rear (2000).



Jean-Luc Godard's 1977 Aaton 8-35. Square rod.



Aaton 16, Aaton A-Minima (2000), Aaton Xtera (2007)



"Jean-Luc Godard a pensé à vous et vous?" inscribed inside Aaton 8-35



Bolex Paillard (1960) cutaway

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