

Jon Fauer, ASC

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Art, Technique, and Technology in Motion Picture Production Worldwide

Japan Production Report

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Kyoto Studios

Inter BEE

Canon Expo

Still Digital Times

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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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Cover: Cinematographer Norimichi Kasamatsu, JSC and Director Lee Sang-il (in blue jeans-jacket) on “Ikari” (“Anger”) Photo by Yasuhiko Mikami

Opposite page: EXT. KYOTO COBBLESTONE ROAD IN RAIN - NIGHT Photo by Jon Fauer

Raptor Macro Full Frame Lenses by IB/E-Optics at Band Pro



A new line of FF Macro Cine Lenses were introduced at the Band Pro Open House on December 10 in Burbank by IB/E President Klaus Eckerl and Band Pro President Amnon Band. As we go to press, they have a name. Raptor.

Klaus said, “The new macro lenses were designed to address the industry-wide movement toward larger format sensors, including RED W6K and W8K, Sony a7, Canon, Nikon, and ARRI Alexa 65.”

Klaus knows a little something about Alexa 65. He’s an optical designer. If you drive east from Munich, you reach Freyung just a few miles before the Czech border. His company, IB/E, is in a large building near the middle of town, and they’re the ones who make the Alexa 65 lenses.

The first focal lengths in the new IB/E Macro Full Frame Raptor lens family are 100mm T2.9, 150mm T2.9, and 180mm T2.9. They cover Full Frame (24x36 mm / 44 mm diagonal), VistaVision (25x37.7 / 45 mm diagonal) and RED W8K 21.6 x 40.96 (46.31 diagonal). Close focus is 1:1 magnification, meaning you can fill the Full Frame 24x36 format with an object that is also 24 x 36 mm. At 1:1 Magnification, you lose 1⅓ stops.

Although designated “Macros,” these lenses are intended to work throughout their entire focus range, from MOD of 1:1 to infinity. They have internal focus mechanisms, consistent position of the focus and iris gears (no need to move follow focus or lens motors when changing lenses). The front diameters are all the same: 95mm—same as Leica Summilux-C and Summicron-C.

The lens mount is UMS PL—Universal Mount System—familiar to users of IB/E Extenders, Expanders, and conversion kits. It quickly converts, without tools, between PL, Canon EF, Nikon F, Sony E and MFT mounts.

IB/E Optics is well known for expanders, adapters, BavEyes, IBE-Lux 40mm T1.9, S35 Scope, industrial, machine vision, and ARRI Alexa 65 primes and zooms.

The Macro FF lenses are expected Summer 2016 and are distributed worldwide exclusively from Band Pro Film & Digital.

www.bandpro.com

www.ibe-optics.com

How to Use the IB/E Macro 100 Raptor

Look at the photo below. There’s an unrepealable optical law that says a lens absorbs more light as it focuses to very close distances.

Let’s say we’ve been shooting with the Macro 100 at a distance of 5’6” and our aperture is T2.9.

The director yells out from video village, “Move in closer.”

We dolly in to 40”. The green number below the footage scale shows us to make an exposure compensation of +0.1 stop. (The red numbers tell us the magnification ratio: here, 1:7.7.)

But, uh-oh. Our aperture is wide open: T2.9. So, we need to add a little more light: +0.1 stop more, which we can determine with an exposure meter. If, on the other hand, we were lit to a T4.0, it would be a simpler matter of opening the iris by 0.1 stop.

And what if we wanted to do a continuous focus move from infinity to Minimum Object Distance, 12.2” — 1:1 ratio? We know we’ll lose 1⅓ stops at 1:1. So we have to light the scene to T5.3. Set the aperture to T5.3 at infinity. Next, attach iris and focus motors and program a lens control system like a Preston, cmotion, or ARRI to open the iris as we focus closer.

Image magnification and exposure compensation values are engraved on the focus barrel of the lens — in the same style as the ARRI/ZEISS Master Macro 100. The irises are **not** mechanically coupled to the focus for exposure compensation, as they were on the ARRI Macros of the 1980s.



Raptor Full Frame Primes (cont'd)



Band Pro's Amnon Band, President & CEO and Jeff Cree, CTO, cradling IB/E Optics prototype 100mm Macro FF.



Klaus Eckerl, President of IB/E Optics.

Loses 1 $\frac{2}{3}$ Stops, Not 2

Emails from FDTimes readers after the Open House launch flew back and forth. “Hang on, don't Macro lenses lose 2 stops at 1:1 close distance, not the 1.75 stops of these lenses?” We asked Klaus Eckerl. It's quite interesting. Klaus explained:

Here are some explanations of this rather simple but sometimes misunderstood topic.

The formula is: EXPOSURE FACTOR = (1 + magnification) squared.

At 1:1 close-up magnification: (1 + 1) squared = Exposure Factor of 4.

Exposure Factor of 4 means 2 stops. So you would have to compensate your exposure reading by 2 stops. In other words, at 1:1 Close Focus, if you had the lens iris set to T2.9, your light meter should read T5.8. — you need 2 stops more light.

In reality, it is a bit more tricky. The values of our Full Frame Macro Lens specifications show the actual measured data.

How can it be less than a 2-stop exposure compensation?

It's the influence of the design principle. If you just calculated the magnification while decreasing the Object Distance and increasing the Lens Distance to the image sensor, then the exposure factor of 2 is true. (That's what happens if you see a lens whose front barrel is moving away from the image plane as you focus closer.)

But we have an internal focus setup. Therefore the focal length effectively changes while focusing, and that is why the exposure compensation of these lenses is actually 1.75 stops.

Why Band is Bullish on Full Frame

Why is Band Pro bullish on Full Frame? Amnon Band said, “Our industry cannot stay put. It always progresses. We saw the move to better film stocks and from standard definition to HD, to UHD, from 2K to More K. The main reason I feel so strongly about Full Frame Format for Cine is the drive for increased resolution, 4K, HDR, and an improved viewing experience. There's a physical limit of how many pixels you can put into a given size sensor. Only Sony has provided a Super 35 sensor 8K camera, the F65. But Sony's big success story has been their a7R and a7S e-mount mirrorless still cameras—which are Full Frame.

“Adding more pixels is like pushing more people into a crowded room. You can only push so many people into that size room. If you have more people in your party, you need a bigger room.

“If we want more resolution, more dynamic range, a bigger sensor makes sense.

“I don't think the interest in Full Frame is only driven by a desire to get more information and resolution. There is also a clear artistic drive. It's not as if we haven't seen this before. The Full Frame format has been the standard for still photography for a hundred years. A lot of cinematographers and rental companies are in the passionate business of trying to stand out. To have a competitive edge can result in better business, more jobs, more distinction. The passion of establishing something different provides an advantage, and that drives technology. The leaders in this business are the ones who dare to take the next step. And everybody wants to be the first to try something new, in a new format, with different lenses. We don't know what will become the next standard for lens and camera mounts. It would be nice if there were agreement on one size. But we're going to be neutral. Every lens and adapter we make will have an interchangeable UMS mount.

“It's important to understand the rental market. Right now, big format is expensive and exclusive. But I'm certain that will not be forever.”

One other thing is almost certain: characters like Klaus and Amnon are not likely to leave us with only 3 Full Frame Raptor lenses. I would guess we'll see a few more Raptor primes by NAB in April.

IB/E Optics Raptor Macro FF Primes

- Focal lengths: 100, 150, 180 mm
- Aperture: T2.9-T22
- Close Focus: 1:1
- MOD (Close Focus 100/150/180 lens): 12.2" / 15" / 18.5"
- Maximum Aperture at 1:1 Close Focus: T5.3
- Focus Rotation: 300 degrees
- Iris Rotation: 70° Iris Blades: 9
- Gear pitch: 0.8 (industry standard)
- UMS PL Mount (converts to Nikon F, Canon EF, Sony E, etc)
- Adjustable flange focal distance (no shims)
- /i Lens Metadata optional
- Image Circle: maybe 50 mm - covers RED W8K
- Length Flange to Front for 100, 150: 145 mm / 5.7"
- Length Flange to Front for 180: 200 mm / 7.9"
- Front Diameter: 95 mm / 3.7"
- Approx Weight 100 / 150 / 180: 1.5 kg / 1.9 kg / 2.9 kg