

One word on HD

Electronic cameras, Zeiss DigiPrimes and back focus

By Reinhard Wagner

Bandpro Digital & Film recently invited customers, clients and manufacturers to its headquarter in Burbank, California, for a HD event with a deep insight into electronic HD camera lens technology. Participants got some background information on Bandpro followed by explanations from representatives from Bandpro Digital & Film and Zeiss about their co-operation and relationship in the development and marketing of DigiPrime lenses.

Amnon Band, founder and owner of Bandpro, started the company back in 1984 as Band 84. Back then, they were dealer and service provider for the production market in southern California: training technicians in how to handle batteries, maintenance of film equipment and dealer for Anton Bauer and Alfred Chrosziel film tools. The partnership with companies such as 16x9 Inc, Petrol and Sony enabled the business to grow rapidly.

A first subsidiary was opened in Tel Aviv, Israel, in 1992, followed by a daughter company Bandpro Munich based in Germany. The Munich subsidiary was founded after talks with the Zeiss in regard of the development of Prime lenses — dedicated to the electronic film

market — as a direct German-speaking competence and reference partner.

Since the early 90's Amnon Band has been an impassioned evangelist for HD in the electronic camera sector. Back in 2000, he also was the representative interlocutor during the initial negotiations with Carl Zeiss for the close partnership and marketing co-operation of new DigiPrime lenses. The trigger for the talks were requests from cameramen, tired of thinking of back focus adjustments while working with electronic cameras, fixed focal lengths and telephoto zoom lenses. When Zeiss people became convinced of the lens idea, Bandpro invested a considerable sum to cover the development risks. The



Amnon Band: HD evangelist

first results of the close development were presented at IBC 2002 and in December 2005, Bandpro delivered its 1,000th DigiPrime lens to Digi 8 in Burbank.

At IBC 2005 Zeiss and Bandpro showed the second telephoto zoom lens in addition to its DigiZoom 6-24 mm T1.9 — the TeleDigiZoom 17-112 mm T1.9 as a product dummy (which will be followed by a first prototype at NAB 2006).

During the HD workshop and HD event at Bandpro, Clairmont Camera and Plus 8 digital led a lively discussion between cinematographers, directors and technicians about focusing in general and back focus issues (ie, adjustment). With HD lenses, the depth of field is shorter/limited compared to similar SD lenses. Representatives of Zeiss and Bandpro explained — with the President of Sony Broadcast USA present — requirements and subtleties within electronic film productions with Prime lenses and e-cameras. Sony's HDW-F900 CineAlta camera (approximately 450 in use in the Hollywood vicinity) has a specific mark which represents the film plane (similar to Cine cameras from ARRiflex, Moviecam and



Alan Albert, Executive VP of Clairmont Camera, explains the modifications made to the HDW-F900

Panavision) and can be used by the camera assistant to measure the distance precisely.

Primes from Canon, Fujinon, Cooke and Zeiss are used that way. Nevertheless, when changing lenses, this mark was relatively inaccurate concerning the distance scale of the lens, because the index markers on electronic cameras do not indicate the de facto plane of the image. The fact is that the camera markers neglect the image plane shift caused by the prismatic block and the filters.

These optical components between the lens and the CCDs displace the actual image plane by 17mm away from the lens. The uncalibrated distance scales of ENG and broadcast lenses covered this lack of precision. This lack was first encountered when Zeiss DigiPrime lenses with individually calibrated scales were available. Therefore, Zeiss developed a camera correction sticker for Sony cameras that allows the marking of the exact image plane of the e-camera.

The Hollywood rental-house Clairmont Camera reacted to this and solved the 'problem' in a specific way. Alan Albert, Executive VP at Clairmont, explained that they decided to modify all 20 Sony HDW-F900 CineAlta HD rental cameras coming from their facilities.

One of their modifications was the replacement of the Sony die-cast aluminium lens mount/frame assembly (holding the 'optical head block') with a redesigned one made of CNC-machined billet stainless steel alloy (B4-mount). One of the reasons for this change was that the aluminium mount was not designed for frequent lens changing.

As such, burrs can and will develop with use. The burrs prevent the lens from seating squarely against the mount, resulting in back-focus errors and uneven focus across the frame. Another fact is that aluminium contracts and expands from cold and heat.

Most of the heat is produced internally (the HDW-F900 holds two fans to reduce temperature).