

# 4K GOES MAINSTREAM

## Behind the Scenes at Sony Headquarters in Japan

by Bill Mead, FJI Digital Cinema Editor



This past August, Texas Instruments announced they had begun shipping 4K DLP Cinema devices to their partner manufacturers, Christie, Barco and NEC, and almost immediately the manufacturers announced they were demonstrating 4K DLP Cinema projectors to customers with rave reviews. No doubt, TI's other DLP Cinema manufacturing partners will be making future announcements about availability of 4K DLP Cinema projectors. It's likely many new 4K-capable products will be featured at ShowEast.

Of course, Sony—4K's pioneer and prime mover—will be at ShowEast with their third-generation SXRD 4K projector. We recently visited with the Sony Digital Cinema team at their headquarters in Japan and learned more about their technology and products, and took a tour of the production facility where they build the projectors.

First, a few thoughts on where 4K is going.

4K is increasingly being discussed possibly not only because of the DLP Cinema 4K announcement, but because as digital



exhibition matures, there is a growing understanding of where 4K projection is justified in today's cinemas. Now that 3D has become almost commonplace, we are seeing a renewed interest in improving the 2D experience—and higher resolution is the obvious route. While 3D has eclipsed all other presentation issues in the past few years, and has done wonderful things for exhibitors, it is not for everyone and every title. 3D is great simply because it is 3D, but unfortunately falls short in other visual

aspects. Bright 2D in 4K, which doubles the horizontal and vertical resolution of 2K, seems to be finding its rightful place at the top end of the exhibitor's presentation options. Plus, you don't have to wear the glasses!

The benefits of 4K projection depend largely on content, and relatively few people have actually seen true 4K—that is, images captured and delivered in 4K. While there are benefits to using a 4K projector when showing 2K content (less pixel structure or more light due to their design), seeing end-to-end 4K is a truly unique experience and can look strikingly good even from the back of the auditorium. The good news is that more 4K is coming. With over 50 4K releases so far, the rate is expected to accelerate as more post-production facilities adopt 4K workflows.

When 4K DCI packages and 4K projection become commonplace, Sony will rightly receive the credit for getting the ball rolling. From the start, Sony has insisted that 4K was needed in cinemas. Maybe driven by insight into where consumer formats are going, Sony representatives worked with industry groups to develop standards and practices that promote 4K and 3D production workflows. Choosing to develop SXRD display technology instead of licensing the DLP Cinema technology was a bold move. Since DLP Cinema was already accepted by the studios and community, Sony had to start from scratch on proving their image quality.

Sony is pushing forward, gaining commitments and making more 4K deliveries around the world. As for this fall, Sony has over 4,000 installations around the globe and at the current rate of installations, expects to hit 6,000 in early 2011. Approximately 2,500 of these installations are under studio VPF (virtual print fee) agreements which Sony manages. In the U.S., Sony has ongoing commitments from AMC, Regal, Muvico, National Amusements and others. In Europe, exhibitors such as Apollo and

Vue Cinemas have jumped on board. Most recently in Asia, Sony announced they have secured a commitment to install Sony Digital Cinema 4K projectors in all of Toho's 545 Japanese auditoriums. Toho is Japan's largest and probably most conservative exhibitor, so the Toho commitment is quite an accomplishment for Sony.

Sony is also more than a projector and server manufacturer, providing the software and servers to run them, as well as a "managed services" approach for customers who can choose to buy a product, or buy it together with financing options through VPF deals with the studios. In addition, customers can turn to Sony for digital signage, including displays, controllers, software, installation, monitoring, maintenance, content creation and distribution.

Sony also has been increasing their production capacity for their current SRX-R320 Series 4K projector. During our July visit to Sony's R&D campus in Atsugi and factory in Kosai, we discovered they are going to extraordinary measures to build a quality product to ensure customer satisfaction.

Located outside of Tokyo, Sony's Atsugi facility is their primary research and development center. Here, a team of individuals dedicated specifically to digital cinema provide product design and customer support for Sony sales offices around the world. Team members at the Atsugi facility also coordinate the worldwide VPF business agreements that were negotiated with the Hollywood studios through Sony's Los Angeles office.

The projectors are manufactured at the plant that builds virtually all of Sony's professional products, located near Hamamatsu, a small resort town on Japan's central seacoast. Sony's Kosai site is an impressive state-of-the-art manufacturing facility. Around 10% of the company's factory production capability is devoted to digital-cinema projectors and servers, with the other 90% used for Sony broadcast HD cameras, recorders and other related components.

At the time of our visit, the factory was producing 28 projectors a day in a clean-room production environment that was run like clockwork, with the progress of each projector being assembled tracked on a LED display above the production floor. The critical sub-assemblies, particularly the optical block, server and related components, are all coordinated and tested in advance of being integrated into the final assembly. The line workers are guided through each assembly step by instructions displayed on LCD panels, while using tools such as smart screwdrivers that know what they are doing and how many turns to give each particular screw.

The SXRD display panels are manufactured at a separate Sony semiconductor facility located in the southern region of Japan. While the company was a bit cautious about revealing too many details of the SXRD panel, we were told that Sony is now on its fifth generation of SXRD display device design, with each newer version being of higher performance, with higher contrast and stability and longer life. The SRX-R320 projector is air-cooled, thereby simplifying design and maintenance. Instead of conventional liquid cooling, each of the three display devices is kept within its temperature range by Peltier device, which acts as a solid-state heat pump.

A separate quality-control team works independently of the production line, randomly testing the output. In one special room, there were 15 SRX-R320 projectors that had been randomly pulled from the first production run undergoing stringent 24/7 testing. Each projector had installed in its light path a housing containing a target screen and monitored with a camera so any deviation in image quality would be immediately detected. All 15 projectors were being cycled through what would be a normal daily multiplex use cycle. This batch of projectors has been running for several months and will continue presumably through their full life. The objective is to find and resolve any unforeseen component aging problems before they become an issue with customers.

Our visit to the Sony manufacturing facility in Kosai along with the Atsugi R&D campus opened our eyes to the resources Sony has dedicated to the cinema market and how deep the engineering talent goes within the organization.

TI's support of the 4K option is a perfect example of how competition between technology providers has driven exhibition presentation quality ahead and has kept the DCI-specified format clearly ahead of consumer formats. Support from multiple vendors is a significant stepping stone for 4K in general, as the competition that actually creates the market. TI's DLP division announced their roadmap supporting 4K in June 2009 and now the industry has the opportunity to evaluate the two in the marketplace. There is nothing better than the real-world application to sort out where 4K fits into the marketplace and who has the best approach.

TI providing a 4K option is good for Sony as well. One of the early obstacles that cinema technology providers have had to face was Hollywood's reluctance on relying on single-source technical solutions. The studios prefer competition among their vendors. Competition among technology suppliers is healthy for the industry, drives costs down

and performance up. With a DLP solution as well as the Sony SXRD approach, 4K becomes its own category independent of Sony or any other vendor.

The question of how much difference 4K means to the average exhibitor is a matter of opinion. Advocates believe in the benefits of 4K even when playing 2K content, such as less visible pixel structure when viewed up-close, and smoother images due to the up-scaling in the projector. From a marketing standpoint, 4K is one more enticement—like the many other theatre amenities that exhibitors can use for differentiation. 4K's value in bringing people in will depend largely on marketing efforts to promote 4K awareness. Right now, 3D is the big marketing draw; promoting 4K and 3D now would cause confusion.

The visual advantages of 4K images over standard 2K images are hard to quantify. The general understanding is that adding more resolution is better up to a point, but then the costs begin to outweigh the benefits. Conventional thinking is that only the first few rows benefit from 4K, while Sony counters that modern auditoriums place the viewer much closer to the screen than industry guidelines recommend, so much more of the audience would see visual benefits in 4K projection. Many auditoriums place seats less than one picture height from the screen, while industry research on visual acuity suggests that the benefits of 4K resolution extend back to possibly as much as three picture heights. If true, it's not just the first few rows that will see benefits from 4K, but a good deal of the auditorium.

Today, routine 4K production is not commonplace and the vast majority of DCPs are standard 2K, leaving most 4K projectors up-scaling 2K content. With true end-to-end 4K content, some viewers complain that 4K is too sharp, and the images don't look cinematic enough. This is clearly a creative issue, but it is better to have "resolution headroom" in the projector, and creatively manage the intended overall sharpness during production and the post process. In principle, the projector in the cinema should not be the limitation in resolution seen by the audience.

Higher resolution projection was bound to happen. The number of pixels keeps going up in every other consumer display device and cinema exhibition can't afford to be an exception. For the auditoriums that justify it, 4K is now an available option. Thanks to companies like Sony and the many other companies now following their lead to provide better cinema technologies, the filmmakers, exhibitors and audiences all win in a global race-to-the-top in presentation quality.

# Full-Service INNOVATOR

## From 4K to Content, Sony Electronics Has Exhibitors Covered



GARY  
JOHNS



DIANNE  
LA GUARDIA

by Andreas Fuchs

**T**o be perfectly honest with you, it's busy," says Gary Johns, senior VP of Sony Electronics' Digital Cinema Solutions group, about the current deployment status of over 4,000 4K systems worldwide. The nicely matched-up numbers are indeed a milestone worth celebrating at ShowEast. "Here in the U.S. alone, we are doing over 350 installations a month now," Johns continues. "Actually, our schedule will take us over 400 per month within the next few months."

Currently, "we have 11 U.S. customers signed up for Sony's VPF program, representing 1,062 screens," details senior marketing manager Dianne LaGuardia, "and another 50 or so with 23 exhibitors directly." It is a well-known fact that the largest partners, "thus far representing 2 600 locations," are Regal Cinemas and AMC Theatres. But Sony is also working with many other national and regional chains, including Hollywood, Muvico and Landmark theatres, as well as individual players like Alamo Drafthouse, Cinemagic, Camera Cinemas, Lincoln Square Cinemas and the legendary Prytania in New Orleans to implement 4K projection technology and other Sony solutions. (For a full list of 4K locations worldwide, go to <http://bit.ly/fji1110sonyb>.)

Globally, "the market doesn't have much of a consistency yet," LaGuardia explains. "There are many deals and lots of deployments happening, of course. We have been doing it for a while longer in the U.S. Other countries have been deploying as well, just not as consistently yet." Based on the information she has seen from the other countries, "by end of December, worldwide screens will be closer to 6,000. Woo-hoo!" she exclaims.

Given deployment and demand, does Sony

experience any kind of backlog when it comes to production and delivery? After all, it took a while to get 4K technology going. "The issue for us wasn't that it took us a while," Johns corrects, "we needed the commitment to ramp up first. Once we had that commitment, we already had the plans in place and were actually able to ramp up pretty quickly. We use solid production techniques, so that can increase with the number of sales. We are nowhere near our production capacity at this point."

Early on, however, "everybody was saying, 'There is no way Sony can do this level of production.' The fact is that Sony is a premier manufacturer of electronic equipment. For over 50 years, we've been making millions and millions of items. So we have a pretty good handle on how to manage production and production capacity." (For more information, see Bill Mead's special on-site report about Sony's manufacturing facilities on the preceding pages.)

Speaking of those capabilities, Sony's d-cinema business is not just about projectors, but includes all the components necessary, which Johns says make up an "integrated system" of Sony projectors, media block, server and software. "Clients like it a lot to have a one-stop shop. If they need to talk about any of the equipment elements, they only have one call to make... One of the key methods of our system is that it was designed to work together. We are not just a projector manufacturer or just a server manufacturer. We make both and designed them to work together. This said, we are open and are, in fact, doing some things with Doremi right now."

For Johns, it is all about "really looking to provide a full range of services to theatres." In addition to the d-cinema systems, "we also offer LED panel signage of varied sizes, be it for box office, lobby or concessions. Sony doesn't just sell but also offers a full range of services with the products. We can install them, monitor them through our network operating center, make repairs if necessary. Again, it's a turnkey approach to digital signage, or we can offer only the parts. For example, AMC and Regal buy the bulk of their signage from us. If you walk into most of their theatres, you will see Sony displays."

Sony Digital Cinema also offers solutions for what to put on display. Content is very much a growing part of the "digital hub" that Sony is creating for cinemas, Johns assures. "We want to be able to provide to the industry a wide range of products and services. Content is one of those. We have done successful testing so far with gaming on the big screen and concerts that were recorded near-live to understand what the market looks like and how to go about it. We are now formulat-

ing our plan how to go forward with content that also includes talking to people about opera and sports as well."

Whereas "The Hot Ticket" is a part of Sony Pictures Releasing ([www.thehotticket.net](http://www.thehotticket.net)) and "obviously a great concept," the d-cinema group's activities come under Sony Electronics. "Our group works closely with Sony Pictures as well as Sony Music and our Gaming division to make sure that we are consistent in our approach," Johns insists. "We are separate business units but are all talking about what might sense for us to collaborate on."

Similarly, the hardware component of Sony Electronics provides further point of contact. "The production and post-production group provides everything from high-end cameras and 3D systems to complete trucks for production companies. So we have a lot of exposure to everything from origination to display on the screen, and ultimately on out to the consumer." Sony's content business is "definitely part of the plan and, from the d-cinema perspective, we want to offer to the exhibitors a wide range of content that generates additional revenue streams for them and for us. We are working on it right now."

What else is on the horizon? 5K, 6K, or something brand-new? "I don't know if I could take too much more," Johns laughs. "No, seriously. At Sony, we've always got product in development. We have new technology that we are working on every day to constantly improve upon our offerings. We are looking at ways, for instance, that will reduce overall cost of operation in the theatre and increase any one of the parameters that exhibitors care about, including ease of operation and brightness." Though, "frankly, I don't know what else we've got left to improve upon."

On the subject of new technology, Johns graciously agrees to comment on the latest laser projection initiative by The Eastman Kodak Company. "Everybody is looking at laser as one of the potential technologies to increase brightness and reduce operating cost. Sony certainly is." Not having seen the Kodak demonstration, he would not comment on the presentation per se, "but I'm not surprised to see that Kodak or anybody else is working on laser projection. We know who all the different groups are and certainly try to keep up with what's going on." To put the development in perspective, "Sony's been in the laser business for many years," he confirms. "This past March, Sony Corp. announced our own laser modules to be used for driving digital projection. We use laser in so many ways throughout the corporation. One of the great things with that is that we get to share technology among groups."