Wolf Cinema's Jim Burns

Gary Reber

While on the 2008 Home Theater Cruise™ to Alaska this past June, I was able to sit down with Jim Burns to discuss the launch of Wolf Cinema, his new performance video venture with Sumiko's John Hunter and Donald Brody. The news that Jim shared is very exciting, and I trust that our readers will appreciate their leading-edge video projectors being introduced at the CEDIA EXPO (Custom Electronic Design & Installation Association) in early September.

Gary Reber, *Widescreen Review*: Jim, please tell us about your new venture, Wolf Cinema.

Jim Burns, Wolf Cinema: Wolf Cinema was started in November of 2007. The company was started to take advantage of changes in the market and also to fill the need for custom integration products in high-end home cinema. There are a few manufacturers that currently sell into that market, and there are some nice products going into that market. The market's getting stronger; it's still growing. The time has come to help home theatre move on to the next level. Currently, there are a couple of basic types of projectors being sold into the custom installation market for home theatre. There are a lot of industrial products that were designed specifically for computers and PowerPoint presentations. Those are kind of like PA systems—they're bright, they're portable, they do a great job for exactly what they were designed for, and you can show video on them if you want to. This is the type of product that was put into our market before there were video-specific projectors, and for some reason they are still found out there today. Then came high-end television sets—flat panels and projectors included—that do a very good job of being a bright television for a media room or even being installed in a custom home cinema. What's not available, and what Wolf Cinema is providing, is a complete package that is designed for the system integrator from the ground up and that is also a videophile's product that does everything as perfectly as technology will allow.

***WSR* Reber:** What about brands like Runco or Vidikron or SIM2 or JVC or Marantz?

Burns: They're very good, but the way they design projectors is a little different than what we're doing. Their projectors are designed to be hung in a room, and now, using multiple lenses, a lot of them can be put way into the back of the room, and this is where the industry started to change. Once custom installers got projectors they could put in the back of the room, well, why would they want this big, black albatross hanging in the middle of the room and causing all this noise and detracting from the environment? When Theo Kalomirakis designs a home cinema, he doesn't want one of these things hanging in the middle of the room. It's just not what he's looking for, and interior designers don't want them there either. So the industry evolved beyond what these manufacturers are currently doing. The custom installer now will build a separate room for these projectors and shoot the light through a hole, and a lot of times they'll build a box that's called a "hush box" to make the projector quiet, or they'll hide it in a soffit. So one of the things that we're doing at Wolf Cinema, with our custom integration solutions, is we're coming out with an integration unit. It does not have fancy, shiny tooling on it. We will have a tooling unit also, but the integration unit comes as a square, black box with the lens that comes out of the front. Then we include a fan kit and ducting with it, and it's designed to be built into a hush box, or into a soffit, or into a separate projection room without the custom installer having to know how many cubic feet of air per minute the projector needs, or how many BTUs of heat the projector is putting out. Adapting a fan and ducting to a projector not designed for it is not straightforward. Using an aftermarket kit does not account for the heat the projector chassis puts out. Our projectors are insulated and fully enclosed, so there is no need for a secondary cooling system in the hush box or soffit. We've done all the math; we've taken care of all that for the installer.

***WSR* Reber:** Is this internal box, that's meant to be hidden, available in variable sizes?

Burns: It's as small as we can make it for the projectors.

***WSR* Reber:** So, the size will depend on the projector that you're…

Burns: Yes, it's according to the projector size. The current products that we have are fairly small for how bright they are. Our smallest package uses a 500-watt lamp. The upper end uses a 1,500-watt Xenon lamp. And I believe that's in a black box 28 inches wide by 21 inches long and 11 inches tall

***WSR* Reber:** You mentioned a tooling version.

Burns: There is a tooling version, which is a "bling" version. And that's the unit that everyone's used to; the type of projector that everyone's used to putting in the middle of the room. That unit is going to be slightly larger. So the tooling for the integration box is as small as possible. We've made sure we've put in an easy door to adjust the projector by the integrator, which is a little light pipe that needs to be aligned up perfectly. As for the cold fold mirror, we have a trapdoor to align that. We have a separate door in the back to easily change the lamp as well as access for the lens schemenflug [focusing]. We have the cables in the back for easy connections, and integrated onto the back of the projector there's a relief and a little bar designed for tying your cables down as a strain relief.

An important part is the ducting. We use flexible, insulated ducting that's insulated mostly for sound purposes. Even the integration unit is very quiet. We put more into the tooling unit to make it even quieter because it is going to be put into a room. We have a 4-inch intake for air going into it and a 6-inch exhaust. And that's done for two reasons—there are multiple ports for the intake, the air intake and the air exhaust. For ease of installation, there are two choices for intake, and exhaust ports on the sides or rear of the projector. With two different sizes, intake cannot be confused with exhaust. The other reason is we're pushing air through the projector, so the intake is a little bigger than the exhaust.

***WSR* Reber:** So the tooling unit is a final cosmetic unit you could hang in a room?

Burns: Yes, that's the unit that everyone's currently used to. And the integration unit's a little smaller package. The fan can then be

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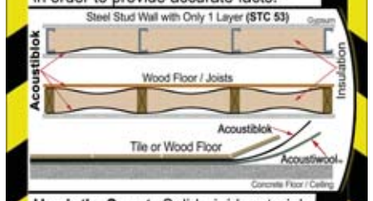

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mounted externally, and even be put up to 40 feet away from the projector, venting to ambient air. If you really want to get it into the attic, or somewhere else, this fan runs very quiet.

***WSR* Reber:** Let's talk about the projector technologies you're going to be introducing. How do they differ from other high-end projector manufacturers?

Burns: Well, see, a lot of people make good televisions and high-end televisions. The tagline for our company at Wolf Cinema is "High-Fidelity Film." And what we're looking to do is really create that cinematic experience for the customer. And the best technology that we have at this time is a DLP® light engine with a Xenon lamp. And one of the nice things with the position that we're in at Wolf Cinema is that we buy raw light engines from different manufacturers. We add our software to them, we add our technology to the optical path, and then we put our scaling in front of them. So these units are very different, and the heart of it is we can cherry-pick the very best light engines that are out on the market and make them even better for the custom integrator, and even better in the home. So it'll be DLP to start, all 1080p, all Xenon-based lamps. The reason we're using Xenon-based lamps instead of UHP is the light spectrum is far closer to the sun's spectrum and far more complete than a UHP lamp is. Xenon is even better than some of the new laser projectors being talked about.

***WSR* Reber:** In addition to three-chip DLP technology, are you going to be introducing a single-chip DLP projector?

Burns: We do not have plans for a single-chip at this time. We'll have to see what happens there. I'm not sure we want to go in that direction. We will have less-expensive three-chips in smaller packages, and they will have mercury-based lamps. With the mercury lamps, we'll be doing very, very heavy color filtering to get the proper color space out of them. All of the projectors we're launching at the 2008 CEDIA EXPO will have yellow notch filters to get a DCI-like color space, so we're very close to that specification. To be true DCI, you need to have special software and special features that you can only get from Texas Instruments.

***WSR* Reber:** DCI means Digital Cinema Initiative?

Burns: Yes.

***WSR* Reber:** And that's a set of standards specific to the professional cinema, in projectors?

Burns: Yes, it's a set of standards put together by an alliance of producers and equipment manufacturers. And what they're trying to do is have this digital medium emulate film.

***WSR* Reber:** What will be the price range of these projectors?

Burns: They will be from $60,000, and as this hits the press and CEDIA happens, it's entirely possible we'll have a system over $200,000. You will have to come see us at CEDIA to find out.

***WSR* Reber:** Will the starting projector at $60,000 include an integral or an outboard processor as well?

Burns: It's an outboard processor that will not work without the projector. The reason we're doing that is to make sure it works flawlessly with this projector, so it needs to see its specific projector or it won't work. And the reason for that is we want to make sure control is as robust as possible. So when one gets turned on, they both get turned on, and they always work exactly hand in hand and step in step together, and they're not fighting each other.

***WSR* Reber:** And in this processor, there's scaling, etc., and other different aspects of video adjustment?

Burns: We're doing things a little differently with this first group of projectors. The light engines that we have are very capable. To the installer, they're not going to know whether they're making the adjustments in the light engine or making the adjustments at the scaler. It'll be completely invisible to them. They can point the remote at the projector—it works. They can point the remote at the scaler—it works. The reason for that is, with these light engines, we are able to get 14-bit gamma correction and we can better emulate the gamma slopes of film. I've written some proprietary gamma slopes that we'll have in there that emulate different types of film and compensate for different types of ambient light.

***WSR* Reber:** Jim, can you tick off the differences between the best high-end projectors and what you're going to be introducing? I mean, why buy a Wolf Cinema projector? What's the high-end consumer looking for ultimate video performance to expect?

Burns: Well, there are probably one hundred different points in there, and every little point and every little change we made makes our projectors better. The major changes that we have in the projectors are going to be our yellow notch filter, to make the color space proper and be able to hit all the different standards; the color space in the projector is large enough where we can hit all the different standards, including the digital cinema standards. We have a proprietary light path, and in that light path the projector gets tuned for the screen and for the room. We can hit a 0.05 foot-Lambert level for black in probably every type of room condition.

***WSR* Reber:** So, if a customer had a performance theatre and he wanted it all black, are these projectors able to take advantage of that room's blackness?

Burns: Yes, we can exceed the DCI screening room level for black very easily with the projector. Now, just so you know, that does take down the peak white of the projector, which isn't a bad thing because there's a variable iris and lamp in the projector. So this way, when the customer comes in and he has a Super Bowl party, and he wants the lights up a little bit—change the channel on the projector, the iris opens up, the lamp turns up to a higher power, and we're able to accommodate a lot of ambient light. These are very powerful projectors.

***WSR* Reber:** Great! What else? What are some of the other things you're going to be doing that's unique?

Burns: The tuning. The way we tune them to the room is very unique. We have three options for adjustable light paths. These options overlap in their adjustability, so we can cover any type of room or application and screen type to achieve maximum real-world contrast ratio. We are also introducing a new feature that we call "Veriscope."

***WSR* Reber:** What is Veriscope?

Burns: Veriscope—if you think about the way the industry works right now, other projector manufacturers did a great job in bringing widescreen to the marketplace. And their projectors are native in either 2.35:1 or 16:9 [1.78:1] if you get the sled that moves the lens back and forth. That's great because now you have HDTV that's not compromised, and you have 2.35:1 movies that aren't compromised. Well, what happens when you watch *Battle Of The Bulge* in its original theatrical release of 2.67:1? You're going to have black bars at the top and bottom of the screen, or what's most likely to happen is they're going to cut the sides off, and you're going to miss a little bit of that content. Now, it's not a lot but it's enough to be missed, and when we get to systems of this size and customers that are this demanding, they're not paying us for a compromise. While there aren't a lot of movies over that size, what happens when we have 2.10:1 or 2.00:1? A fair amount of movies are 2.10:1 and 2.00:1. At that time, you've got black bars on the side, or the image ends up getting smaller and you're doing a double letterbox with it. The big issue, and the reason we came up with this feature, is 1.85:1 movies. Over 60 percent of the movies produced today are 1.85:1. Now 1.85:1 is a little wider than 16:9 and not as wide as a 2.35, so the way every other projector manufacturer implements this at this time is they will take the 1.85:1 and they will chop information off the sides. Now, when they chop off enough information to get it to fit in the 16:9, they may chop off half the people's faces, or the worst of this is they'll do a letterbox within a letterbox. They'll leave the screen in 16:9, so you've got the width of the 16:9, and then you shrink the height of it, so you've got this constant-height home cinema that's not constant height. That's a very bad solution because the picture gets small. But the greatest distortion is caused when people take the 1.85:1 image and stretch the sides out to make it 2.35:1 or 2.40:1, so it fills the whole screen. Now you're watching something that's in the wrong aspect ratio. It's kind of similar to what people did in the old days by watching anamorphic DVD on a 4:3 television. It's that same fabulous effect, with everything being squished in the wrong shape. The other solution that some people use is to fill the width of the 2.35:1, but you crop the top and bottom. Then you're cropping everyone's head off, so there is not a good solution for that. In our system, with a 1080 source, we perform pixel-for-pixel reproduction for all aspect ratios. We perform this operation with our precision optics, not scaling. Every aspect ratio can have a separate memory in the projector. The optics are automatically adjusted with motors. Or if a 2.40:1 or wider screen is not desired, we achieve different aspect ratios the traditional way with our scaling.

***WSR* Reber:** So this is all motorized in the lens assembly?

Burns: It's all motorized in the lens assembly, right. Now, the advantage of this is a 1.85:1 image retains 96 percent of the pixels. So in our 1080p projectors, we will have perfect geometry without any distortion, and we'll have 1,037 pixels. We're throwing away only 43 pixels, which is great, right?

***WSR* Reber:** Yes.

Burns: Very, very little compromise whatsoever, and the way a lot of systems are set up, they tend to overscan anyway, so you're getting pixels cropped off top and bottom. With ours, we can be a little more precise with that, so you don't have to do that overscan. It's really a very nice solution. Then

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anything over a 2.35:1 image, we do the opposite. The 2.35 lens slides into place, and we do the same thing with the zoom and focus. So 16:9 and 2.35:1 are both 1080 lines. A 1.85:1 image is 1,037 lines. A 2.70:1 image is going to be 940 lines using a 2.35 lens, and at 2.10:1—we retain 85 percent—that's 940 lines also. So by doing it this way, we're throwing away less than half the lines that someone else would if they weren't using the 2:35 lens and just zooming it. Now, we could also do that, and that is just plain Veriscope. I just described Veriscope 2.35. Plain Veriscope gives you pixel-per-pixel imaging 1080 lines at 1:78:1. At 2.35:1 you end up with 816 lines, and 1:85:1, once again, you end up with 1,037. We're able to do this in place and give you a true constant height home theatre without the 2.35 anamorphic lens, and there are some good reasons not to use a 2.35 anamorphic lens.

***WSR* Reber:** What are they?

Burns: First off, for short-throw rear projection. The aperture of the 2.35 lenses that are on the market at this time are not big enough for rear projection, so a lot of people complain they can't do a 2.35:1 screen, they can't do constant height. So they have to do a 16:9, and they live with the black bars at the top and bottom. With this system, we can do short-throw rear projection and zoom and focus the lens and give them all the effects of a constant-height home theatre.

***WSR* Reber:** You're saying you don't need an anamorphic lens?

Burns: We don't need an anamorphic lens. With the anamorphic lens, we do keep more pixels, and we like to keep more pixels.

***WSR* Reber:** So you offer an anamorphic lens?

Burns: We offer it with anamorphic lens, but Veriscope also works without one and there's a cost savings for that, and amazingly, if the person is super sensitive to contrast ratio, the contrast ratio is better without the 2.35 lens.

***WSR* Reber:** What is the shortest distance for Veriscope?

Burns: The shortest distance that we have for Veriscope is a 1.2:1 throw. The shortest distance we can use in a rear-projection system is a 0.7:1 throw. That's without Veriscope, again, but that's a super-short throw.

***WSR* Reber:** With a 0.7 throw, if you had a 6-foot-wide screen, you'd have to be 5 feet back.

Burns: Correct. Five feet back.

***WSR* Reber:** And if you use a first surface mirror, you can fold that in half.

Burns: Yes, and really at that point, you can then use the 1.2 lens, which has zoom capabilities, so we can get you the aspect ratios and use a mirror.

***WSR* Reber:** Are you going to offer your own mirror assemblies, or are you going to let a Stewart or someone else do that?

Burns: We have no plans for offering our own at this point.

***WSR* Reber:** What is the range of the long-throw lenses?

Burns: We can do very long throws, up to seven times the width of the screen.

***WSR* Reber:** Wow. Now, on all of your projectors, are the lenses interchangeable?

Burns: Absolutely. They're all interchangeable, and they're all high-contrast lenses.

***WSR* Reber:** Are you going to offer different quality lenses like some manufacturers do?

Burns: You know, there's no reason to start making compromises with these lenses. These are digital cinema lenses, these are absolutely the best available. One of the reasons we did that—I was considering the high-brightness lenses for use in a media room, although we have projectors that are very bright, and you would be hard-pressed to come up with a media room big enough to need those lenses. We're fairly good at competing even with direct sunlight, and have a gamma slope for it. So for that reason, I don't use high-brightness lenses. The other reason I don't use high-brightness lenses is they aren't compensated the same way high-contrast lenses are. The high-contrast lenses are compensated so all the elements move together as the lens heats up. On some of the other high-end Xenon projectors on the market, with the lenses that are being used, you need to wait 45 minutes to an hour-and-a-half for that unit to come up to temperature before the picture's in perfect focus. And at that point in time, your movie's almost over.

***WSR* Reber:** So there's no focus delay time?

Burns: No, there's very little delay time. After about 15 minutes, it's in full focus. But like I say, the lens is compensated, so cold focus is very, very good.

***WSR* Reber:** What's the life of a Xenon bulb?

Burns: We go from 1,200 to 1,500 hours for these lamps, depending on the power setting. The projector can send an e-mail to the installer to let them know the lamp needs replacing.

***WSR* Reber:** Jim, your targeted audience, obviously, is really high-end custom installation. So what about your dealer structure, what do you plan for that?

Burns: Well, Wolf Cinema's structure is a spin-off of Sumiko Audio's distribution company. Sumiko started as a phono cartridge manufacturer in Berkeley, California, and it was named after one of the wives of one of the original founders. About 16 years ago one of my current partners, John Hunter, decided he wanted to purchase the company; he wanted to take it to the next level and really start moving it along. The lawyer that helped him put the deal together and who was his council was Donald Brody. Donald was a musician and was instantly bitten by hi-fi two-channel. He had never heard anything that great, even being a musician. He thought it was really fabulous, it was a great business, and so he closed his practice and jumped into two-channel audio with both feet, and he has run the business end since then. So Donald Brody, John Hunter, and I formed a new corporation, which is Wolf Cinema.

The three of us wanted to create a video company that makes products that work as promised, delivered when promised, and is easy to use while setting standards for imaging. That has never been done before.

***WSR* Reber:** What about warranty? What do you plan to do with warranty and serviceability and things like that?

Burns: Well, as I mentioned before, the units are designed with service and installation in mind. We do have, as you'll see, a very different and very classical design for our projectors that are mounted in the rooms—that do need to be mounted in the room. And we have access panels for everything, so installation and service are number one on the list in the design of these projectors from the ground up, which is a very unique feature. Amazingly, it's a very unique feature for projectors.

Along with the serviceability, we have a feature that we call "Wolf Sentry." All of these projectors can be plugged into the Internet. They have their own IP addresses, and they can be monitored remotely, so if the customer would like the dealer to monitor his projector remotely, they can monitor it remotely. If there is a problem with the projector, the dealer can say, "Great, let me go take a look at your projector. I'll go online and take a look at the state that the projector's in." They can see almost every single parameter for brightness, contrast, color, tint, and the channel that the projector's on. The customer says, "Hey, the projector's the wrong shape." "Okay, what movie are you watching?"

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Also, when the lamp is about to die, it can send an e-mail to whomever you program in there. It can send it to the end user and to the dealer at the same time. We also have this option for when the lamp reaches its half-life, so halfway through the lamp's life it can send a warning e-mail. Any error codes, if there are any problems with the projector, can be sent by e-mail, saying it has a problem. Also, serviceability for the dealer—if the dealer gives us the IP address and there's not a firewall in the way, we can take a look at that unit ourselves remotely from our offices in Berkeley. And if the case so happens that there's a new feature that we've come out with, or some upgrade and they don't have it, we can install that software from our facilities in Berkeley.

***WSR* Reber:** That's pretty great service.

Burns: Yeah, it's nice. The dealer can also reset the projector back to its installed condition remotely from the field, too—I thought that would be a good feature to have—as we can, if we have access to it.

***WSR* Reber:** As the Xenon bulb deteriorates to its half-life, what happens to overall quality? Is it just a drop-off in light-level capability or are any other parameters impacted?

Burns: Currently, our brightest Xenon DLP projector can easily handle a 40-foot-wide screen. Now there aren't a lot of homes that can take a 40-foot-wide screen, so a lot of people say, "Well, I don't have a 40-foot-wide screen, why do I need this projector?" One of the reasons you go to a larger projector, one with a larger lamp in it, is for headroom. We have an optical sensor that needs to be calibrated at install that is in the light path of the projector. The sensor will look at the projector when it's calibrated and maintain a constant calibrated intensity. It'll look at the lamp and say, okay the lamp is putting out so many lumens, and we'll make that its reference, so as the lamp ages that sensor will go back to the CPU in the projector and it will compare it, and if it's not bright enough, it'll slowly raise the amperage going to the lamp to keep the projector at the proper brightness for that channel, and this is different for every channel too, so you're going to have different lamp levels and iris settings. So it will keep this projector in tune and very close to perfect calibration because as long as the lamp's putting out the same amount of light, it's very close to the same spectrum of light also. So we keep it in calibration as it goes through its life. That's one of the advantages of getting a projector with a larger Xenon lamp, or a projector that's capable of a very, very large screen when you have a screen a quarter of that size in your home.

***WSR* Reber:** So are you saying then that the initial calibration setup will last a long time?

Burns: Yes, the life of the lamp. And after that, a minor calibration will need to be done, when the new lamp gets put in. Every projector should be recalibrated every time a lamp goes in, no matter who makes it, if we make it or if someone else makes it. The issue with a lot of the current UHPs on the market right now is that spectral output for color on it is a moving target. We might have a solution for that, or way to minimize those fluctuations in the future. We might be able to talk about that at CES.

***WSR* Reber:** What about recommendations for 2.35:1 or 2.40:1 screen structure in terms of flat versus curved?

Burns: Well, first off, maybe we don't need to stop at 2.35:1 or 2.40:1. With our Veriscope 2.35 system, if you really want to be able to see every image in the proper aspect ratio, you're probably going to want a 2.70:1 screen, correct? I mean, you're not going to open it up often, but when you're having this custom install done, there's very little expense, if any, really, changing the aspect ratio from 2.35:1 to a 2.70:1. So I would probably suggest you put in a 2.70:1 screen in a designated home theatre. This way it can open all the way up, and you can see the few movies that are filmed in that aspect ratio. That's first off. After that, even with a short throw in our 2.35 lenses—you're familiar with a pincushion that you see—we have processing capability to get rid of that pincushion effect, which we call "Wolf Warp." So it actually will warp the image, and we do lose a couple of pixels doing this, but the overall image quality is much better; you do not have geometric distortions. It gives us the capability to do short throws on a flat screen if you don't want a curved screen or it's a roll screen. If it's a multipurpose family room, a curved roll screen just doesn't exist, so you don't have that option. So you end up with these distortions because the matte black in the screen doesn't hide the smiley face on the top and the frown on the bottom. Wolf Warp will correct for that. Also, in the short throws, you tend to have white field uniformity issues. By that, I mean, the anamorphic lens tends to make the corners a lot darker than it does the center. So we're able to adjust the white field uniformity and get you a very good white field top, bottom, left, right, beyond what you've ever seen before. This is another reason for a bigger Xenon lamp. We can do a lot with these flat screens. Now, in a designated home theatre, where it's not a roll screen, and since we're doing a 2.70:1 screen, it might be a very good idea to use a curved screen even without the 2.35 lens, just to keep the ambient light off the walls, and it helps the contrast ratio. It focuses the light back toward the center. Curved screens are very good for that reason also.

***WSR* Reber:** Unless you have black walls or walls that are not going to reflect.

Burns: Unless it's the *Widescreen Review* theatre.

***WSR* Reber:** Right. Okay. Well, who's making an engine like this?

Burns: Wolf Cinema.

***WSR* Reber:** So, when someone buys one of these projector packages, let's just say at the low end of your line, $60,000, does that come with the whole tooling and/or integration unit, or is that an option?

Burns: You buy the normal unit, which comes in a very nice, stylish box and it can be put in the room, or you buy the integration package. We have two versions of the same projector. Now, the integration package is really, like I said, just a black box with a couple of different ports on it, so depending on where you have the best access, you can take the air in and out from the sides or the back, or a combination of the back and the sides. The box is black, so it will disappear into a soffit—we also suggest you paint the inside of the soffit or the box you build for it, black, to keep reflected light down, on it—you decide that when the unit's purchased.

Oh, one other issue with the integration is this projector has a set of screw feet that can either go in the bottom or go in the top, and the reason that they go in the top is the offset's a little different, depending on the projector's orientation being at floor, table mount, or ceiling mount. A lot of installers have issues with getting these projectors into a tight space because they are sliding it into a small soffit, and when they slide it in there, there's no way to get a mount in there. So they have to make shims or wood blocks, or something to get the projector in the proper orientation, and unfortunately, over time the room shakes or the subwoofers cause the projector to vibrate around in there, so we actually have rubber feet that screw into the top or the bottom that are adjustable, to get the projector level on both sides.

***WSR* Reber:** What about energy efficiency?

Burns: I have to look that up. I believe, with the fans and the 2.35 scope, we start at 750 watts, and I think we go up to 1,500 watts. The larger projectors all run at 220 volts, so they are much more efficient. Any of our projectors, actually, you can run at 220 volts, which does make them more efficient.

***WSR* Reber:** Anything else that you want to talk about that we missed?

Burns: Yeah, we have six HDMI 1.3 inputs and a passthrough for audio, HD-SDI; all that stuff we can get in there.

***WSR* Reber:** And you're going to introduce the first projectors at the CEDIA EXPO?

Burns: We will have a couple of projectors installed by CEDIA. Sumiko's dealer base has roughly 300 dealers, so we're working with those current dealers because we are being distributed through Sumiko. And some of the dealers, their key dealers, already know about the product. We're having one put in a showroom and two being installed; we will have a few installed by the time we hit the show.

***WSR* Reber:** Fantastic. That's exciting. Now, what about people who would like to have that technology but in a more affordable product?

Burns: We will be moving downstream in the price point in the near future. We've had a couple of different discussions, and it looks like we're going to stay all three-chip at this point in time, as we move down to double mercury and single mercury lamp light engines. As well as, possibly, moving upstream with a couple of surprises.

***WSR* Reber:** What about outside of projection technology? Are you going to enter the flat panel field?

Burns: We are absolutely going to work with flat panels. And from the Sumiko end of it, this is really great and important to us because this is really where the high-fidelity video portion steps up. Flat panels, as a whole, are very nice, very sexy television sets, but I can't think of a single one that has the proper color space or a good enough black level to really be considered a reference monitor. With our external processing and with the panels we have coming out, we should be able to provide that sometime in the first quarter of 2009.

***WSR* Reber:** Fantastic. All right, so no external OEM processors, it's going to be all your own processing.

Burns: It's all of our own processing.

***WSR* Reber:** So it's a whole display system?

Burns: And that's a key, one of the keys to every product that we're going to do. We will obviously have some changes over time, but our operating system will remain consistent. So, if you're one of our dealers and maybe you're one of Sumiko's audio dealers that does very high-end two-channel, you start selling our flat panels. The same way our flat panels get set up and calibrated is the same way our $100,000 projector gets set up and calibrated. Now there are more features and there is more adjustment on the projector, but the basic calibration—brightness, contrast, color, tint, color temperature, and color management—will all be the same. The menus will all look the same, everything will all be in the same place. There's not going to be a need for the custom installer to learn five, six, or seven different operating systems as they go through our product line. They are way too busy in the field, everything is way too complicated, and one of our jobs is to make their job simple. If their job is simple, it's easy for them to install, the product is also more robust and less likely to break, and everyone's happier all through the chain—everyone from us to the installer to the customer.

***WSR* Reber:** So how much pre-planning have you put into this project?

Burns: We've been working on it nonstop since November of last year, so when we launch product at CEDIA, that'll be a year's work to get these products out. And some of this started before I was there, so I believe this has been going on since June of 2007, where my partners had already started working on the project and getting these larger projectors into the system and into production.

***WSR* Reber:** That's exciting! Anything else? We've pretty much covered everything, right?

Burns: I think that's it, Gary. There's a lot in there. See you at dinner here on the ship. The Home Theater Cruise has been great, thanks to all for facilitating it. **WSR**