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How Edge Blending, Scaling Add Up to Environmental Projection Success

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How Edge Blending, Scaling Add Up to Environmental Projection Success

BY ANDRES CAAMANO

As churches are winding down Christmas production planning and planning beyond, one consideration may be to create a virtually immersive worship setting. To make it happen, part of an environmental projection equation often includes edge blending.

With edge blending, it entails trying to cover a large area with projection. By doing so, it pushes the limits well beyond the capabilities of a single projector.

When using multiple projectors paired with edge blending, the images created are partially overlapped. In many cases, the overlap can be one-third of that projector's created image.

The end result? A cohesive image that spans across a much larger area.

In what sounds to be a very complex undertaking, the first question should be, "'Why are you doing it?' Followed by, 'And what's the purpose?'" noted Mark Hanna, owner of FxN Productions. Going further, he asked, "Why do you want that shape and that size?"

ProPresenter A Valuable Edge Blending Tool

Upon determining the specifics and that edge blending is needed, there are many ways churches can do it well. Those options don't have to be expensive, beginning with using Renewed Vision's ProPresenter 7 and its now-bundled edge blending module.

For many churches, turning to ProPresenter for such a solution is very convenient. It just so happens to be what most houses of worship use for their lyrics and production work.

"ProPresenter is the leader. If you have to do edge blending, (most churches) have ProPresenter already," said Camron Ware, owner of Lightware Labs and founder of Visual Worshiper.

Elaborating on the value of ProPresenter for churches, Stefan Svard, president of Audio Video Electronics said, "It is one of the best tools to cost-effectively do edge blending."

Beyond just ProPresenter, undertaking a project that includes edge blending has become much more feasible in recent years. That's largely due to the growing prevalence of laser projectors. "With lamp projectors, one of the issues was how the color temperature shifts as a lamp ages," explained Svard. "With the advent of laser projectors like the 3LCD projectors from Sony, Epson or Panasonic, the color accuracy and consistency is an order of magnitude better."

Laser Projectors a Great Match for Edge Blending

In seeking how best to succeed on a project using edge blending, laser projectors have shown to be a particularly strong option.

"A laser projector won't change its luminosity and color as quickly as a lamp projector," said Svard. By contrast, a lamp projector will render color that will "degrade over time, and will change over time."

When facing cost pressures, another major factor is brightness, noted Liam Monroe, creative producer for Bethel Production. "You can always try to get away with more budget-friendly projectors, but you'll run into them not being bright enough. That's where the biggest issue is, in terms of expense, whether they throw out enough brightness."

Edge blending is very often used when trying to "create scenic elements (using projection), instead of going the LED wall route," said Monroe. Edge blending, though, goes well beyond environmental projection. For example, a valuable wide screen projection setup would include a 16-foot by 9-foot screen behind a worship band.

"If you want to create a very big and very bright image, most of the times I see a horizontal strip of video behind the band," noted Ware. "The images are edge blended, and are more cost effective than a big LED wall." Such setups are seen in youth rooms, Ware noted, where one might "use two or three projectors edge blended behind the band, or as a wide screen above the band in the room."

Make It Easier, Don't Mix and Match

Among the best ways to flourish when doing edge blending when using multiple projectors is having each be from the same manufacturer. Better yet, "It's definitely the safest for them to be the same model, even as they will still have slight variances, for brightness and output," Monroe said.

Using the same model, though, is just a beginning factor. It is crucial to also use the same lamps in each (if they are lamp projectors). Going further, if the projectors use lamps, ensure each used lamp has run about the same number of hours.

Why is that key? That's because one shouldn't expect close to identical performance from a new lamp versus one used for about 2,000 hours. Likely the differences in performance will be stark between the two lamps in such an example. Hanna noted, "you might not see (the difference at first). At the same time, though, I can see the projector on the left is 3 degrees cooler, and it's driving me nuts."

Recalling one Christmas season, Hanna remembered borrowing projectors at a church, aiming to fulfill an environmental projection project, "from all over the facility. The projectors did not match (with the other already installed projectors) in the auditorium."

In trying to capably edge blend using different model projectors,
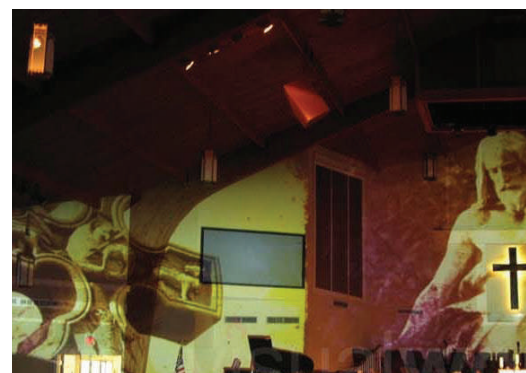
Hanna noted, "you will make it hard for yourself. Where they overlap, if there is a higher brightness (between one projector over another), it will make it tough to fudge, to make it look seamless."

Select Projectors Offer Features To Simplify Edge Blending

In trying to minimize the challenges with edge blending, various tools are available beyond the ProPresenter plugin.

For example, a Christie projector typically has edge blending utilities integrated right in the unit, noted Hanna. They include Christie Twist, which works within a grid point/mesh interface. The utility easily allows precise control to edge blend and stack multiple images seamlessly across a 2D or 3D surface. With the interface, it "looks at the image, does the math, and does the edge blending for you," he added.

Upon considering low-end projectors versus professionally installed units, Ware fully sees the benefits offered by professionally installed projectors, in that they "have the warping and corner pinning features, to allow for edge blending to be extremely easier."

Keeping Projectors Configured Is Not A One-Time Deal

Upon setting up a projector along with edge blending, one must recognize edge blending is "an ongoing maintenance issue; not a set-and-forget type of scenario," warned Svard.

That's because once all the finite edge blending settings are in place, it requires regular fine tuning. Some settings require being "constantly aware of alignment. Maybe not weekly, but at least monthly," cited Svard.

From Ware's perspective, "I've told churches, expect to spend 30 minutes a month for tweaking. Maybe you spend five minutes each Sunday, to turn on a blend grid to align the projectors, and make sure the lines are still matching up."

Among the most common culprits that throw a projector off and require readjustment, is a church's HVAC, explained Svard, "which causes a shaking of the roof deck. Or when the sun comes out, the roof expands. During the summer, the sun gets hot and the steel gets hot. When the sun goes down, the steel contracts … it's something we can't avoid."

With ProPresenter, many of these settings can be adjusted via the software, while others are tweaked using built-in capabilities within some projectors. One coomon feature that helps with minor projector adjustments is lens shift, moving a lens either up or down or left and right, without having to tweak the unit's install position. In addition, if the image is slightly skewed and not a perfect rectangle, keystone correction is a helpful feature.

Sometimes, though, needed adjustments go well beyond a slight tweak.

"At my church, where you have a kids ministry, they might be playing dodgeball, and a projector gets knocked out of place," explained Monroe. "Or in California where we are, there are earthquakes, where any shift in a projector will make a seam noticeable."

How Much Edge Blending Works Well?

In figuring what should be the desired overlap between two intersecting images, Ware pegged the overlap at about a third. "The more you edge blend, the better. The more you overlap, the better. And with more projectors, the better and the less obvious the edge blend will be," he explained.

Other variables to calculate ideal overlap, Hanna said, relate to a projector's

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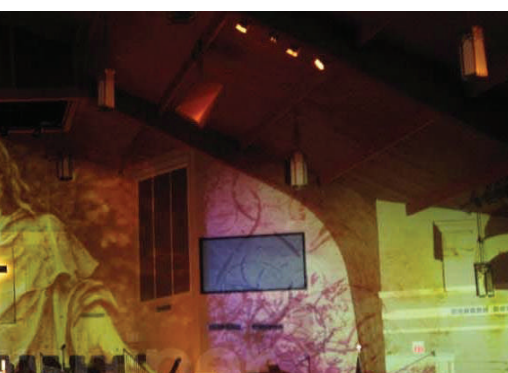
brightness and resolution. Over the years, he's seen configurations with overlaps as minimal as one-fourth, up to two-thirds. From experience, though, Hanna said he "usually uses about a third of the image."

For Monroe, the variables that come into play regarding an edge blending overlap, begins with overall screen size. Typically, he noted "aiming for a quarter of the image size. When you start getting into giant screens, you can have a three to six feet overall overlap, depending on the size of the screen."

Projection Content Likely Needs Some Scaling

Once a church opts to do edge blending, the screen content typically will require some scaling, usually upconverting lower-resolution content. The challenge arises in determining how much is acceptable, before the content becomes too pixelated.

"If you are upscaling by 10 percent, that's fine, especially for environmental projection," noted Hanna. Scaling aggressively, though, can be problematic. "When you blow it up too much, it has the capability to make it look bad," said Svard. "Are you taking low-res images and blowing them up significantly?"

When scaling content up in a configuration that also edge blended, additional issues arise.

"Upconverting and scaling a standard definition image to an HD image, surely causes pixilation," said Monroe. "It adds a gritty texture to the image,

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and makes it hard to edge blend right. Essentially, you are not outputting pixel-for-pixel correct, as you are adding pixels to the image." As a result, correctly determining the actual lines of the image becomes complicated with the added distortion.

From experience, Ware said, when working with multiple projectors and edge blending, scaling content becomes almost a 100 percent necessity. That's particularly true since the screen most often won't

match the pixel count of the source. As elaborated by Svard, "Rarely does a church have source content that is 1-to-1 for what the (projection wall) is in size," particularly when a screen is ultrawide.

With an expected high need for upscaling video content, anticipate a small amount of latency or display delay, at least a few milliseconds. To minimize potential latency issues, Monroe suggested the content be at least HD in its original format and

avoid drastically scaling the content. As another means to limit latency, Monroe added, "use the camera lens to zoom and make it bigger, instead of upscaling the signal." ⊤

Andres Caamano *is a writer and editor with nearly 20 years' experience, including over four years bringing attention to the latest news in audio, video and lighting technology for houses of worship.*