

Crystal Clear

Dave Matthews Band's design team experiments with projection mapping and unusual shapes By: Sharon Stancavage



For this summer's Dave Matthews Band tour, production and co-lighting designer Fenton Williams consulted with both Matthews and Aaron Stinebrink, who shares the job of lighting design. This time out, Williams says, "I really wanted to get into the realm of projection mapping." Stinebrink adds, "It's out of our comfort zone in terms of the set piece, projection mapping, and trying to make the set be an overarching structure for the audience. This is something that the band hasn't done in the past."

Projection mapping on this tour is done on a 25'-tall-by-40'-wide custom surround fabricated by Torrance, California-based All Access Staging and Productions, Inc., the band's longtime scenic vendor. The shape of the projection surface, Williams says, is "based on the rock formation of geodes; I drew a 3D shape that I thought would be fun to play with." The surface is flat, although it doesn't appear to be. "Basically, we're trying to invert the look of a crystal formation," Stinebrink explains.

Describing the layout, Stinebrink says, "All Access built a custom truss skeleton; each crystal is applied separately to it. Each has its own aluminum frame." Erik Eastland, president of All Access, adds, "Making the screen surround [with its unusual shape] manageable on a daily basis was a challenge—if you don't engineer it right, they'll all hate you on a daily basis—but we worked it out."

The surface, Eastland adds, "is a white, heavy-knit-type material. You don't always need a high-quality, high-gain screen; you have to consider the daily abuse, fingerprints, and reflections. With this in mind, we used something that's not a screen material, but which checked all the

Photos: Todd Kaplan



Opposite: The crystal-formation scenic surround with the ROE Visual MC-7H video screen in the center. Above: The 12 mid-stage pods are filled with SGM Q7s.



The combination of the center LED wall and scenic surround form the production's nexus.

boxes and looks great.” Projectionist/media server tech Brett Gardner, of Chicago-based RGB Lights, adds, “A light-blocking layer of opaque black fabric is applied on the backside, so we don’t get bleed from lighting on the backside and video wall.”

In addition, Stinebrink says, “The structure has to withstand 40-mile-per-hour winds. One reason we wanted such a high strength is that that’s the cutoff point at amphitheaters; once you hit that wind speed, the show is shut down.”

He adds, “We’ve used All Access and Erik Eastland for years and, by far, they are the most professional people I’ve come across in terms of taking a designer’s vision and making it a reality. I fancy myself a drafter, but the engineering work they do is really impressive to see.”

In addition to the eye-catching projection surface, Williams says, “Aaron brought up the point that as the summer goes on, it would be light at the beginning of the show, so it might be nice to have an LED element. That brought me back to a conversation that Bruce [Rodgers,

the noted production designer] and I had about mixing elements, and I thought it could be fun to mix LED with projection mapping.” Consequently, there is a 7.2m-wide-by-4.8m-tall, 7.5mm ROE Visual MC-7H LED screen that fits inside of the geode-shaped projection screen; it’s provided by Charlottesville, Virginia-based Filament Productions.

Creating projections for an amphitheater tour is, at best, challenging, starting with the issue of ambient light. “We fight it every day, whether it’s the sun or worklight onstage,” Gardner says. “We’re projecting on a material with a decent amount of gain, but it up a lot of ambient light. It’s probably not the ideal material, but it is certainly better in terms of traveling well and breaking down.”

Projections are delivered using four double-stacked Barco UDX-4K32 laser units. “Our truss is suspended from the downstage lighting truss, which gives the riggers fewer points to hang and generally less stuff to bring out on a daily basis,” Gardner says. “This comes with ups and downs, but we basically sub-hang our truss so we can lower it independently for service and not be rushed to



The floor package includes Robe MegaPointes and High End Systems SHAPESHIFTER C1s.

fly to trim. We hang after the lighting is up, and we get it down before they need to bring their stuff down. The biggest trade-offs are that we're more susceptible to wind, being lower and lighter-weight; we are also more prone to impeding sightlines below the downstage truss."

The images are overlaid for brightness, Gardner adds: "Our shows can start when the sun hasn't fully gone down, and sometimes, when we use projection, we are fighting the daylight. We're also playing in conjunction with a video wall, so we bring its intensity down—not a ton, but enough to where we get a good level balance between the two surfaces. It's a bright stage, and there's a ton of moving light horsepower in that rig, so you're constantly competing with bright light. Because of the horsepower in the projection rig, it competes well in terms of the ambient light level."

Also, Gardner says, "If we think it's going to be too windy, we'll have to ground-support the projectors near the front of house. Typically, things die down during the show, but we don't have any way of controlling that."

Shape, a feature of the Green Hippo Karst+ media serv-

er used for content control, is one of Gardner's primary tools for mapping: "When applying projectors to a complex surface such as this one, or a sphere, or any oddball surface, you use Shape to place your projectors in 3D space and relationally map them and blend them to create larger images. With the masking feature, you can draw shapes where you don't want to see content, so we can basically shutter off the overspill. If our physical surround was damaged and we needed to modify the object we were working on, we would do that within Shape, and the projection would morph to whatever changes we made."

"Quince Imaging [based in Sterling, Virginia] worked with us on the initial 3D mapping setup," Gardner says. "They sent Matt Hayes, one of their programmers, to the first couple weeks of rehearsals in Charlottesville. They were instrumental in helping us get set up and comfortable with the process. They created the initial Shape files and a bunch of test patterns; some might work better on days when you can see, or when you can't see, or for different phases of the setup. Some have big, blocky colors for each crystal in the sur-



Williams mixes and matches looks on stage in terms of projection, content, and IMAG.

round; each has a different solid color, or we'll do solid color outlines. The goal is to make sure that the content lines up with the shape and the outlines within the content line up with the edges of the crystals; it needs to be spot-on."

The Barco projectors also play a role in alignment, he adds: "We were lucky enough to get the new release of Barco's Projector Toolset [software], which allows you to change the warp color lines, and that's been really helpful. Without it, projection mapping would be a lot harder." IMAG is provided via a manned and robotic camera package—including a Ross Carbonite switcher—from Filament Productions. Content is provided by Aaron Farrington, of To the End of the World Pictures.

Lighting

The lighting rig, supplied by Omaha-based TMS, features 12 midstage lighting pods, fabricated by All Access, that extend the look of the crystal formation. "The pods are lightboxes with SGM Q-7s illuminating them from the inside," Stinebrink says. "On the bottom, we have GLP JDC1s [hybrid strobes] and Robe Spikies [small, fast LED

wash-beams] hanging off each piece." Eastland adds, "The lighting pods came out really well; we came up with a way to fly them in, drop them into a cart, and disconnect them. The lighting guys don't need to do much at all."

The Q-7s are ideal for the 6'-tall-by-5.5'-wide pods. "They worked out really well because the pods are pretty contained spaces, so we used as much beam angle as possible," Stinebrink says. "We shoot each one from the base of the pod up to its ceiling, which is, probably, 6" or 7" away, and it reflects back into the entire lightbox."

Stinebrink also notes that the rig features several Robe products. In addition to the previously mentioned Spikies, these include eight BMFL Spots and 14 BMFL WashBeams. "When not being used as wash fixtures, we can add gobos to the WashBeams, and those have been a lot of fun too," Williams says.

Also featured are 40 Robe MegaPointes, about which Stinebrink says, "They're really versatile, with a fantastic set of gobos and animation wheels that I like. The MegaPointe has an animation wheel, it has CMY color mixing rather than a color wheel and has a little bit more

punch than the [Robe] Pointe.” Many of the MegaPointes are placed on the deck, upstage of the band, along with eight High End Systems SHAPESHIFTER C1s, the latter placed on road cases.

The rig also includes 30 Elation Professional Chorus Line 16s, which light the backdrop. Stinebrink explains: “It’s similar to a GLP [impression] X Bar 20, but a little brighter and with a zoom that is a little bit tighter. They’re located on the floor, just downstage of the backdrop, and on the backdrop truss. Because they tilt, we can shoot them back at the band, into and over the audience; we can use them as dynamic lights as well. It’s our first time with them and we’ve enjoyed having them.” Also used onstage are an additional 26 GLP JDC1s, eight Martin by Harman MAC Viper Wash DXs, and four Martin MAC Quantum Washes. Atmosphere is provided by two MDG ATMe and two MDG Atmosphere APS haze generators.

The production also uses the Follow-Me remote followspot control system, distributed in North America by AC Lighting. “This is our first time with it and I like it,” Stinebrink says. “It’s a dynamic system that you can use with any fixture. We are still using local operators, but no one has to go up in a catwalk or climb a rope ladder anymore, which is pretty nice.”

Lighting is controlled by an MA Lighting grandMA2 console. “We have a bunch of songs preprogrammed,” Williams says, “probably have more than 110. So far, they have played six or seven—maybe even ten—songs that we don’t have anything programmed for; I’ll find something that works for them. They’ll probably play 150 songs on the tour this summer, and 30-plus of those won’t have been programmed. It keeps you on your toes. I think it would be monotonous if we had the same set list in the same order every night.”

To deal with the changing set list, Williams has the production sectioned off into six mix-and-match phases. “Initially,” he says, “we start the show with just lighting. Around the fifth or sixth song, we’ll drop the Kabuki [provided by Rancho Dominguez, California-based Sew What?] to reveal the video elements and soft goods beyond the video wall. As we progress, there are six phases, but not necessarily every night in order, not one to six. They’re six different configurations of how my console will be set up, and which elements it allows me to play with in that given phase of the show.” Each phase mixes lighting, projection, and the LED wall, as well as color, content, and IMAG. “The first show of the tour, I did the phases straight in order and that was intentional,” Williams says. “On the second show, I mixed it up a bit, to figure out what works the best.” He found that it was best to use IMAG, lighting, LED, content, and projection combinations in random order; some songs have IMAG in the center, some have projection in only certain areas, some are just lighting and so on. “It works best to mix and match. Ten songs go by,

and then you go back to a phase that you’ve used, and it’s fresh again. We can also change textures and colors and content to make it feel different.”

Sound

The tour’s sound-reinforcement system features a Meyer Sound LEO PA provided by Martinez, California-based UltraSound. Tom Lyon, audio system engineer, says, “We do main hangs at left and right and side hangs at left and right; each hang can do 16 Leos, which is a total of 64 across the board. Most venues get the four-hang treatment. In narrower amphitheatres, I can’t hang a main and



Matthews and the band are using Sensaphonics in-ear monitors.

CONCERTS

a side down, so we're limited down to normal left/right hang."

Also employed is a sub-hang comprised of 16 Meyer LFC-1100s. "They're usually flown right behind the PA, so there are no ground subs to blow out the front rows," Lyon says. "That means I can drive them nice and loud, having an even SPL from front to back. In some places I can't do that, because they're too heavy; if it's a weight issue, I'll drop the subs down and stack them beside the band."

To make sure the PA sounds great every night, Lyon uses Rational Acoustics' Smaart analyzer. "It is the acoustical analysis we've used for many years now," he says. "We tend to be a bit more in depth with it; a lot of people will lay out mics during the day, do the system alignment, and pull the mics in for the show. We actually deploy mics in the audience—that stay in the audience—so we can see the acoustical analysis live in the system and how it performs in a full room, to make the system as consistent as possible from night to night. A typical deployment involves mics placed around the mix position itself, but we wire up mics in seats in the amphitheater, in front of people."

Lyon says he uses three measurement microphones with Smaart: "It's a mix of wired and wireless [B&K 4006s and iSEMcon EMX-7150s], depending on what makes sense for the day; sometimes, when there's not a cable route, we'll use wireless. They're usually placed in front of our right stack; we tend to put the mics out so that they have slightly different responses. They're in opposing places in comparison to the other mics. Amphitheaters are basically symmetrical, so anything that happens on the right should also happen on the left."

During the show, Lyon is alone at the front of house; when possible, sound engineer Jeff Thomas mixes from backstage. Lyon explains: "We came to the realization that when the show is in a challenging acoustic environment—where it's highly reverberant and loud and not a good-sounding room—when we were both out front, we'd chase each other's tails. As a result, both of us would have bad nights and the show would suffer. We thought if Jeff could mix the band from backstage, or somewhere in a controlled room, he could focus on the sound of the band and send me a really high-quality mix. Consequently, Thomas is mixing the band from backstage, while Lyon is handling the PA at the front of house. It's worked out really well." He adds, "The first time I ever experienced [this way of working] was working a Faith Hill/Tim McGraw tour, when Buford Jones was mixing Faith Hill."

While Lyon and Thomas focus on the PA, DMB's long-time monitor engineer Ian Kuhn has different concerns: "The room acoustic is one of the biggest battles in sound reinforcement for anybody, but many bands will do the same set list every night—or a similar set list—and, at least, will find some consistency that way. Our biggest

struggle is to find consistency because the dynamics of every show are vastly different night to night. So far this year, we've done 36 shows, and the band has played over 86 different songs."

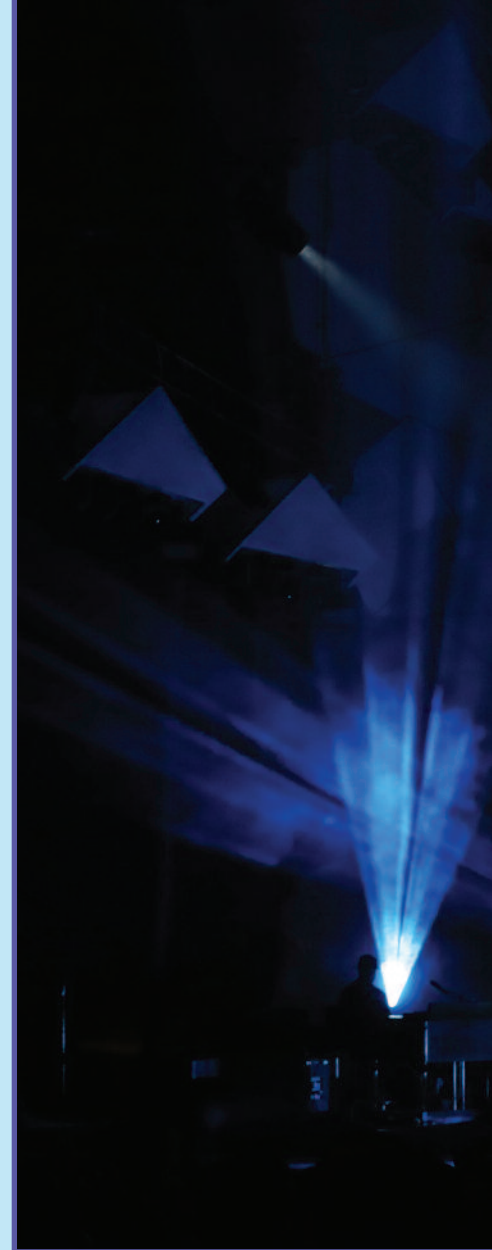
Fatigue is an issue as well, he notes: "When we do three nights in a row in three different venues, that's nine hours of intense concert performance. One of our primary concerns is preventing ear fatigue for the band, crew, and audience."

Also, Kuhn explains: "We have a pretty elaborate intra-band crew communications system. Each musician has a personal microphone; each can hit a button and talk to everybody, or he can give a signal if he just wants to talk to me. Between songs, I automatically turn on Dave's microphone; it's a lavalier [Shure MX150B/C-TQG] that he wears; for Carter [Beauford], our drummer, we have a [Shure SM89] shotgun mic mounted between the toms, pointed at his face." The push-to-talk mics—Shure MX418D/S cardioids with 18" goosenecks—are located on tables behind the band. "We have, over time, massaged this very specific system very well and the band loves it."

Kuhn controls the push-to-talk system via his monitor console, an Avid S6L; it's his first time out with it. "It's added a whole new layer of things I can do to automate the system," he says. "It's a very automatable board and is fun to use. It sounds great, and with the automation it's really helpful." It has one drawback, he notes: "I think it was designed by twentysomethings, because everything is really small and close together and, with my eyesight going the way it is, that makes it difficult. But they've built it into a nice small form factor."

The automation feature is particularly helpful, Kuhn says: "If Dave does a finger-picking part on his guitar, I just hit one button that boosts it 5dB really quickly. When he goes back to strumming, I hit a button that restores it to what it was. When I turn on the drummer's vocal, the overhead mics automatically drop down by 10dB; when I turn his vocal mic down, the overheads come back up."

Kuhn adds, "I wanted to use the stock plug-ins in the





Williams controls the content via the grandMA2 console, working with a Green Hippo Karst+ media server.

S6L; the only thing I couldn't find was a proper dynamic equalizer built in, so I went with the McDSP AE600. It's a multiband dynamic equalizer; they call it the Swiss army knife of equalizers. I put it on the vocals and mix outputs. It's very sweet-sounding, better than any I've used."

The band uses Shure PSM 1000 personal monitor systems, although, Kuhn says, "I think it's about time for Shure to do a digital system for monitors. With the RF crunch we're under—with the FCC selling the bands—everything has to go digital, eventually." However, he warns, "I fear the issues that will come with that. Latency comes in anytime you do a conversion from analog to digital and back again, so the fewest number of times you do them, the better off you're going to be.

"The band wears Sensaphonics in-ears," Kuhn continues. "Three of them use the 3D AARO, which has built-in mics that allow ambient sound to be heard by the musi-

cian at the desired level. If somebody walks up and talks to them, they can hear it out of their respective ears." Matthews, Beauford, and bassist Stefan Lessard are on the 3D AARO. "Everyone else is using the [Sensaphonics] 2MAX [custom silicone] system, except for Tim [Reynolds], our guitar player, who doesn't use in-ears; that's typical for a lot of electric guitar players. He has a Meyer Sound MJF-212A wedge. Part of an electric guitar is the acoustic relationship between the musician's ears, guitar, and amp; that triangle is the instrument, and Tim has always had that same relationship with his sound. I wouldn't want to come between him and his amp."

Kuhn says. "Dave is the most down-to-earth, real guy that I know. Everybody really cares a lot, from the band on down." It's a sentiment reflected by the rest of the team as well. The Dave Matthews Band continues on the road in the US through the second week of September. 📶