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Anything Can Happen

Phish's spontaneous shows require airtight technical support

By: Sharon Stancavage

"We try to use the moving trusses as architecture," Giffin says. "They are very much our entire set."

"This is my 30th year. That's about as rare as it gets; back in the '80s, I really never thought this longevity would be a reality, but here we are 30 years later," notes Chris Kuroda, lighting—and, essentially, production—designer for the band Phish.

Kuroda and the band have experimented with a variety of designs over the years. "Phish is unique in the sense that they walk onstage, play, and have great lighting but not too many distractions," he says. "For production design, I'll come up with ideas and work with a couple other talented people, bouncing ideas back and forth to apply what we, as a team, believe the production design should be. [The band members] are very against IMAG and things of that nature; they like to keep it pure. That being said, when we play a shed, and IMAG is built in for the lawn, they're okay with that. They just don't want to see it in the main part of the venue."

One thing that hasn't changed is that a Phish show is done without a set list. "Phish is all on the fly—it's the world's biggest punt," Kuroda says. "There are over 500 songs that they could play at any moment."

Early last year, Kuroda says, "I received a call from their organization, saying, 'The band has decided that, instead of telling you what they want, they want you to tell them what you want to do. As long as they approve, they'll let you roll with a new concept.' That was the best news that I ever heard."

Automation was the nexus of the resulting design. "I wanted to take sticks of truss, move them around all night long, and create different shapes with the lighting rig," Kuroda says. "I wanted to change shapes to make boxes, arches, smiles, and so on." Programmer and associate lighting designer Andrew Giffin adds, "We try to use the moving trusses as architecture; they are very much our entire set."

In the air are 30 sticks of truss 5', 8', and 10' sections; also featured are two static side trusses. "The one thing we wanted to do—that nobody had been able to do before—was go completely vertical with the trusses, should we decide to do that," Kuroda says. Lititz, Pennsylvania-based TAIT, the show's automation provider,

Left photo: Todd Kaplan; Top photo: Andrew Giffin

stepped in. “Tait helped us engineer hardware that allows our trusses to go completely vertical safely, if we want,” Kuroda says. “We don’t have all the weight hanging from the point at the top of the vertical truss; with the magic of the Navigator [automation] system, we can program it so that the bottom point has just enough weight that the truss is vertical but held in place and not swinging around or spinning.” The system includes 60 custom Tait brackets—two on each truss.

those different situations,” he adds.

This year, the workhorse is the PRG Best Boy HP. “There are 50 of them; it’s our gobo light,” Kuroda says. The unit has a feature that makes it perfect for Phish. “Because the show is a complete punt, Chris is executing the cues in an order determined as the music unfolds,” Giffin says. “Maybe he’s in a look that has the third gobo in, and the next look uses the fifth gobo. You have to cross a gobo in the middle while the wheel is scrolling. The only

The truss layout is a holdover from the band’s previous tour, but it is populated with different fixtures to accommodate such venues as sheds and arenas.

Lighting

“We decided not to change the truss layout from last year,” Giffin says. “It was a 100% holdover from the previous iteration. However, we wanted to populate it with different fixtures.” Last year, the bulk of the shows were in a 360º seating configuration at Madison Square Garden; this year, it’s a more traditional tour that includes sheds and other arenas. “We had to rethink the fixtures to work in

option in most modern lighting fixtures is to snap from one to another or use built-in speed channels, because manufacturers are afraid that you’ll burn up the bearings going too slowly from one to another. With the Best Boys, they’ve done some incredible thermal engineering, and you can, with precise timing in the cues in the console, fade smoothly from one gobo to any other. It’s a game-changer in terms of how we punt, going from one look to

Photos: Andrew Giffin

another look in unpredictable order."

There's another benefit to the Best Boy: "The way the fixtures are built, when the gobos change, it gives the impression that the wheel is moving from left to right across the gate," Giffin says. "In most other fixtures, they appear to change going up or down. We realized that having everything moving to the left or right was a fun look, so we did something a little crazy: We asked crew chief Terry Smith to hang half of the lights backwards. So, literally, all the even-numbered Best Boys are hung with the orientation going 180° from the other ones; we flip the tilt in the console and that allows adjacent lights that are changing gobos at the same time to look like they're melting into or away from each other. With the entire rig doing that, as opposed to all going left/right/up/down, it looks much more organic. You can do it with timing from the console and make it silky smooth."

The Best Boys are loaded with PRG's AirFX gobo package, with one addition. "The package is designed for the aerial graphic projections that we do," Giffin says. "We also made an important substitution: We freed up one slot and added a cone gobo. The old-school cone is such a classic and we use it extensively, but that's not a standard gobo in many fixtures anymore, which we believe is a little silly. We decided they definitely belong in the Phish show."

According to Kuroda, the rig also consists of "Sixty Robe Spiiders, which is our LED pixel light. It's what I like to call a B-EYE on steroids. They're fantastic; I'm so happy with them. The color mix is wonderful, the intensity is beautiful, and the light that comes out is nice and crisp. They are, in my opinion, what a modern-day LED fixture should look like; they're the real deal." Giffin adds: "Each Spiider has 19 pixels; we program them individually. Although they are primarily purposed to be washlights, we also utilize them for

The rig's PRG Best Boys are fitted with the AirFX gobo package, featuring a cone gobo to create looks like the one above.

creating our own unique, pixel-specific animations. This is accomplished via pure lighting programming, without servers or bitmapping, in order to have precise control of the effects." The Spiider is a wash/beam luminaire comprised of one 60W and eighteen 30W LEDs; it has a 5:1 zoom optical system ranging from 4° to 50° and enables designers to choose between RGBW or CMY color mixing.

The rig also includes 32 PRG Icon Edges. "In my opinion," Kuroda says, "it is the best hybrid out there. Any hybrid can make a tight beam; but when you put it into spot mode, many other hybrids basically disappear. You can barely see lighting coming out of them, especially if you're using a saturated color. With the Icon Edge, you can put it into spot mode, and it's bright; you can see the gobo pattern and animation wheel you're using, you can see it all very well, and it doesn't get lost. It's the only hybrid fixture that's a solid solution for an arena, shed, or stadium." In terms of color, Giffin adds, "The color mixing works great across the whole zoom range, even when they are super-narrow in beam mode, and they can do all the tricks that we like. The major reasons Chris and I chose them are because they're bright and reliable, and we love the CMY color mixing."

During the design phase, Kuroda had one concern: "When you're in a concert and the lights go out and the truss is black, how are we going to show that the trusses are moving?" Traditional truss toners were off the table. The solution: "On the end of each stick of truss is a GLP Atom, an idea conceived with Abigail Rosen Holmes last year. It is a little LED PAR that is pointed out towards the audience, like little eyes. When the trusses move, and the Atoms are on, you can see that something is happening up there. That was our clever way of highlighting the motion without doing the old truss-toner look." The Atoms also added another benefit. "As we went along, we learned that they created a nice ambience in the background. So not only were we able to accomplish showing how our trusses move in a new and unique way, we, as a bonus, got another layer out of the show." There are two GLP Atoms on each truss, and eight on the floor that are static. The lighting rig, provided by the Las Vegas office of PRG, also includes 20 GLP JDC1 strobes. Kuroda notes: "That's the beauty of the lighting rig; it's really only five fixture types."

"I wanted to change shapes to make boxes, arches, smiles, and so on," Kuroda says, talking about this movable truss scheme.

Kuroda and Giffin use grandMA2 consoles to do XYZ positional tracking, used in conjunction with the TAIT Navigator system with PosiStageNet.

Programming

Both Kuroda and Giffin are out with the show, each using his own grandMA2 to do XYZ positional tracking, which is used in conjunction with the Tait Navigator system with PosiStageNet, aka PSN and sACN. Navigator programmers Sam Hillyer and Jim Upchurch were important parts of the process. "We're using sACN to send requests from the grandMA2s as translation and rotation per truss, which the Navigator uses to determine the travel of each motor," Giffin says. "Then we receive data back from Navigator via the PSN protocol, which tells us how each truss is actually located in space, given the physical and safety limitations imposed. We further use that information to calculate pan-and-tilt values with XYZ coordinate positioning in the grandMA2 system."

Also, Kuroda says, "Eight Best Boys [two for each band member] are purposed to strictly be specials for the performers. That's the beauty of the XYZ tracking capabilities of the [MA Lighting] grandMA2. No matter what the trusses are in, each special is going to stay on the musician." All lights on the moving trusses—98 in total—are used with XYZ positional tracking.

Kuroda continues, "We must rely on real-world information about where the trusses are to do the XYZ calculations, keeping the lights focused on the band, not just on where we're asking the trusses to be. Navigator does all the calculating regarding the route, speed, angles, and how fast the chain is going to move through to the motors. PSN is merely a way of communicating location back to the lighting console. The instructions from the MA to Navigator are in the form of sACN, and that tells Navigator where we want the trusses to be at any given moment, including moving through space as continuous effects or as dramatic moves from one shape to another."

XYZ positioning is nothing new; however, Kuroda says, "What makes this different is that the fixtures lighting the band are moving through space as the trusses move and change angle, yet they stay on the band members, using what boils down to tracking in reverse. Our 'objects' are the four band members; they are in the same place every single night. There are spike marks on the carpet, so we know the math is true. Basically, I can take a horizontal truss with a light pointing at a band member and make it vertical, and instead of that light now pointing at the side wall, it has stayed on the band member throughout the move of the truss."

The team had been working with XYZ tracking for the past year with limited results. "By the time we left pre-viz last year," Giffin says, "at the end of three weeks we had a solution that was working, but it wasn't as smooth and as clean as we wanted it to be. I had to manage a lot of information during the show and had to be constantly updating data in the console. Last year, we also had to communicate all the moves to the Navigator operator backstage via

Photos: Andrew Giffin

"This is the first year we're driving the truss moves from the console," Giffin says.

headset. It wasn't the most efficient thing in the world and was almost impossible to coordinate in time with the music."

In pre-viz this year, Giffin worked out a completely different approach. "This is the first year we're driving the truss moves from the console. The new solution is a lot more streamlined, and it all runs in the background automatically," he says. "There are custom macros that run with every single cue that involves a change in position. Chris can still go through the looks in any order he wants; all he has to do is hit the button. The moment he triggers a cue, there are several specific commands that must run. This deals with updating information about the equivalent pan/tilt values of XYZ coordinates, depending on where trusses are on relative to the stage."

Running the cueing through the grandMA2s has been a vast improvement over last year's procedure. "The magic of controlling the truss movements from the lighting console, and not just calling cues over a headset, is that we can then do things like adjust the speed at which the motion happens, so that, for example, we can time the end of a shape change with the end of a song," Giffin says. "We can also change the speed of dynamic effects that are running as the music is building or slowing down. These sorts of things were difficult to verbally coordinate with an operator backstage. But if I have my finger on a fader and can tell the song is winding down, I might speed up movement a little bit so that it can finish in the remaining time the song allows—and when the band hits the last note, the trusses stop moving, having landed in their new position."

One of Kuroda's signature Phish moves is a fly-out where fixtures travel from the stage to positions over the audience and vice versa. In programming terms, it's going from XYZ coordinate values to pan/tilt values—and the opposite—which isn't something that can be done smoothly with the grandMA2's existing feature set. "One thing we didn't want to do is dedicate the XYZ lights to the band members and use completely different lights to do the pan/tilt moves," Kuroda says. "That's just not how Phish works. We needed the system to be able to do both."

Although the MA had no built-in functionality to solve the Phish problem, the console was flexible enough to allow Giffin to create a system that works. "To make the transitions smooth without the lights flipping around or taking an unwieldly path, we needed to force the console to always think about the transitions in terms of just cross-fading pan and tilt," he says.

Kuroda adds, "Even though the end result might be an XYZ coordinate onstage, we don't want the console to be thinking about going from one XYZ coordinate in space to another, as if drawing a line through 3D space, which is, by default, how the console would behave. So, we make

Photos: Andrew Giffin

Of the 500-plus songs that Phish might play during the show, only 16 are fully cued in Kuroda's grandMA2 console.

all the transitions with pan/tilt crossfades and once a cue lands, if it's supposed to use an XYZ tracking position, we switch the logic to XYZ mode, so that as the trusses move through space, the lights stay focused on the band members."

Going from XYZ to pan/tilt involves another set of complications. "Because Chris is running the show in a complete punt fashion," Giffin says, "he can be going from look 72 to look five and then adding a rise on top of it, so we can never be sure which fixtures are breaking out of an XYZ position and going to a graphic made with pan and tilt and which ones are going the other way around. Hence the many lines of macro logic that check to see which is where now and where it is going to next, allowing the right path to get it there every time a cue is executed. To make the smooth transition through the air, you always want to think about crossfading pan/tilt values. In the case of coming from an XYZ position to flying out into the air, the first thing we do is get the fixtures out of XYZ mode and give them an equivalent pan/tilt position for where they are. We then allow the transition to happen from that equivalent pan/tilt position, which has to be calculated at the time each cue is triggered, because it depends on where the trusses are that moment."

Reaching the point where he figured out how to achieve the smooth transitions originally considered impossible wasn't a short journey for Giffin. He confides: "It took pursuing many paths over an entire year to come up with a better way to make this work, which finally landed on the method we have now. Because of all the custom coding ability in the console, we were able to implement our own solution. It is not something you can do quickly; I can't just give someone the macros and say, 'Here it is, now it works for you.' You really have to tailor it for the show that you are doing, and it makes programming everything that much more tedious."

At the beginning of the show, Kuroda says, "We have all the trusses in line with each other, horizontally up against the mother grid; to the audience member, it just looks like five straight trusses and it appears very simple. When the show starts, that's when we start moving them and turning them into shapes. Think of the trusses as the roof; it starts off straight and flat and, all of sudden, you look up and it's a dome over the heads of the band. Then it's a reverse dome, a smile over their heads; then it's a slanted roof in a perfect straight line, where the stage left side is 58' off the stage, but the stage right side is 5' off the stage. The whole idea started as going from shape to shape and then sitting in that shape."

Of the 500-plus songs that Phish might play during the show, there are 16 that are fully cued in Kuroda's grandMA. "They weren't chosen because they are the big hits or the most frequently played," Giffin says. "They were chosen because they are the most difficult to punt. They have the

most intricate, complicated timing and they have weird time signatures; they are the ones that we really wanted to get more specific with timing than you would be able to elegantly punt." Kuroda adds, "Sometimes an entire week will go by and none of the programmed songs will be played, and then sometimes they will do four in one night."

Audio

Front-of-house audio engineer Garry Brown has been with the band since it got back together in 2009. "Prior to that," he says, "I was working with Trey Anastasio—Phish's guitarist—on his solo project, mixing front of house; I began working for Trey at the end of 2005."

For Phish, Brown is using a Clair Global Cohesion PA that includes CO-10 and CO-12 boxes. "It's a great-sounding PA: very clean, crystal-clear, a tight and punchy low end, and a great mid-range. I don't think there is anything better right now," he notes.

"We have left and right mains flown with up to 18 CO-12 cabinets," he continues. "Behind the main array are

between three and six CP-218s, which are double 18" powered sub cabinets, depending on whether we are in- or outdoors. The side hangs are up to 16 CO-12s. Going into arenas, we add 12 more CO-12s for the upstage hangs and another 12 CO-12s for the rear hangs. Finally, we have a center hang of four CO-10s, plus 12 CO-10s for front fill, eight along the front of stage and four along the back of stage."

Brown runs the show on a Yamaha Rivage PM10. "Before switching to the console," he says, "I was not a fan of Yamaha, but the PM10 has changed that. It just sounds great: bottom line, end of story." With the PM10, he has "two RPio622 [I/O racks] on stage, plus a RPio222 [I/O rack] at the front of house. The DSP is running two Yamaha HY144-D cards for Dante—one for record, one for inserts over Dante."

Brown is using several plug-ins. "The main one is the Rupert Comp 830; that has been my go-to compressor on the console. I have nine instances of it, ranging from vocals to keyboards. Plus, I have the TC Electronic Reverbs [NonLin2 and VSS 4HD] and Eventide H3000 Live [Ultra Harmonizer] running."

Like many PM10 users, Brown has added the Rupert Neve Master Buss Processor. He explains: "I have it inserted across my stereo buss, enhancing the stereo field by refining the width and tonality of the mix. It's a great piece of gear. I've been using it for the last couple of years and it has become indispensable. The MBP also brings a cohesiveness to the overall mix."

In terms of vocal mics, he says, "We have the Telefunken M81 on vocals. It's a workhorse. It has been the vocal mic for Phish the last eight years or so. It provides a great consistent sound."

For the guitars, Brown notes, "We are using the Royer R-121 Studio and a Shure SM57. The Royer gives a warmth and smoothness to the guitar that, for me, I was missing with other mics." The drum kit includes mics from several manufacturers. "We have a Shure Beta 91A/52A and Yamaha [SKRM-100] Subkick on kick drum. The snare is an SM57 on top, with Neumann KM 184 on bottom. The high hat is a Shure KSM137, we have Sennheiser e604 on toms, and Earthworks DP30/C on specials and a Royer SF24 as the overhead."

Overall, mixing Phish poses several challenges. "One is the close proximity of the band members to each other on stage," Brown says. "The close stage setup allows them to communicate easily, but this causes a reasonable amount of bleed between the instruments. Plus, the band are all on wedges, so you have the added bleed from them. The second challenge is that there is no set list; this keeps me on my toes as I never know what song they are going to play next!"

Phish's fall 2018 tour concluded last month.

Photo: Andrew Giffin