

## PROJECTION, LIGHTS & STAGING NEWS

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# KAOS

Green Hippo, AES and Pangolin Support Technological Marvel

THE VIEW FROM THE DJ'S BOOTH. PHOTO COURTESY KAOS/PALMS CASINO RESORT

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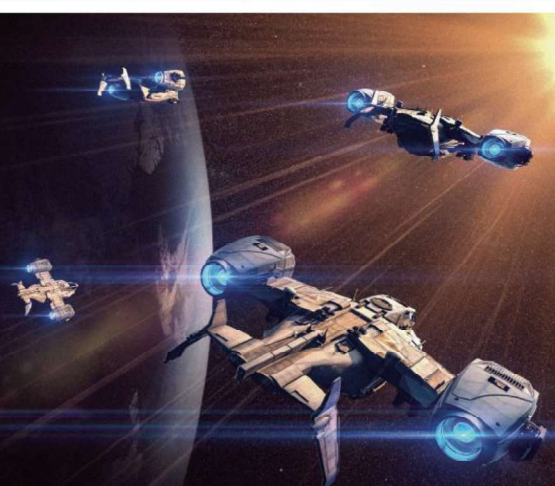
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Chaos has erupted in the desert. To be more specific, KAOS has erupted in Las Vegas. The new 100,000 square-foot day and night club opened in early April launching itself to the forefront of the party scene. With nearly \$700 Million in recently completed renovations by the Palms Casino, KAOS is the center attraction drawing large crowds to experience performances from resident entertainers Marshmello, Cardi B, Kasade, Skrillex and more.

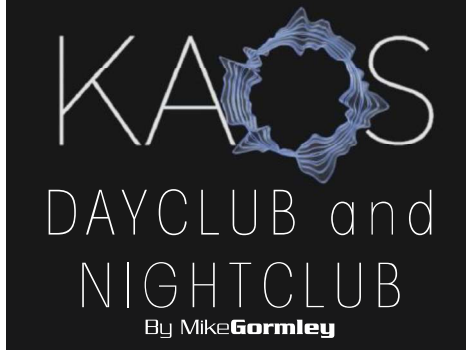
KAOS is a spectacular new entertainment experience consisting of a fully integrated 73,000 square foot dayclub and 29,000 square foot nightclub, which together completely redefines the daylife and nightlife experience in Las Vegas. KAOS features exclusive residencies with world-renowned musical artists, state-of-the-art audio, video and lighting technology and dramatic design and art elements woven throughout the experience. Boasting the highest number of pools of any resort in North America, KAOS dayclub offers a luxe Greek-inspired oasis that can be found nowhere else in Las Vegas.

KAOS seamlessly blends the nightclub and dayclub experiences via a massive retractable glass wall/door that allows clubgoers to easily move between the indoor and outdoor venues. In addition, the nightclub has a rotating 360-degree DJ booth that allows talent to play to both indoor and outdoor crowds, while the dayclub has its own separate entertainment stage in order to provide for multiple performance locations. The dayclub can also accommodate up to 6,000 guests and incorporates a seasonal dome cover that allows it to operate on a year-around basis.

» Vision Becomes Reality

Station Casinos along with Fertitta Entertainment Director Aiden Kemp enlisted National Technology Associates (NTA) to handle the complete sale and integration of KAOS. It was the job of NTA partners H. Waldman and Nevin Edwards to assist Aiden in bringing his vision to reality. NTA works with Station Casinos regularly, however this job was certainly different from previous jobs. Waldman and Edwards commented on this saying, "There was extensive work done during the design phase and getting everything together was daunting. There's a lot of moving parts, so the coordination effort itself with contractors, permits and other companies involved was immense."

The new club showcases a large series of flying LED panels, a multitude of special effects including CO<sub>2</sub>, flames, water cannons, and they even have a custom Tesla Coil set above the heart of the dance floor. Waldman and Edwards note, "The goal was to create the most technologically advanced club in Las Vegas, and we definitely think we hit the mark."



NTA brought in several companies to assist in the installation, including Advanced Entertainment Services and Salvin Design for the special effects, SJ Lighting for the theatrical lighting fixtures as well as Green Hippo for the media control aspects. When asked why those companies were specifically chosen for the job, NTA had no hesitation saying, "As far as the lighting, getting Steve Lieberman and his company in here was an easy decision. He does most of the clubs in town, has the most experience, and is great to work with." Concerning the special effects they added, "We needed someone with a big bag of tricks and AES is the company for that. These guys can run the whole gamut. We also brought in Salvin Design as they are masters in the CO<sub>2</sub> world." Nevin of NTA added with a laugh, "They taught me more than I ever wanted to know about CO<sub>2</sub>!" With regards to using Green Hippo media servers NTA said, "We have a history with using Hippo servers... They are a great product and the Green Hippo team was instrumental in helping us maximize how we could drive the system."

» Video

Throughout KAOS there is an abundance of LED video, all customized to enhance the visual experience inside and outside of the club. Running the length of the eastern exterior of PALMS' Ivory Tower is the city's largest LED wall, which streams live shots of the dayclub and nightclub to the outside world, thereby allowing those on the Las Vegas Strip to see the excitement and energy inside the clubs. An impressive 1,035 25mm Yaham LED panels make up the giant 270' tall screen. In addition to the tower, another 1,624 4mm Yaham LED panels encompass all outdoor areas of the club. Inside the casino, a staggering 9,300 NanoLumen 2.5mm LED Tiles have been installed to enhance not just the nightclub, but also the signage, entrances, ceilings, hallways, DJ booths and much more. In all there are over 64 million physical pixels of video, with all outputs and content, including live inputs, driven at 60fps.

Controlling all of the video aspects was set to be a hefty project, so NTA tapped Green Hippo and Cory Froke to take on the challenge. Cory currently serves as Product Specialist and Supertech for Green Hippo, and he was the logical choice to handle the largest club install of Hippotizer media servers in the world.

Cory showed off his excitement and knowledge about the project by walking PLSN through every inch of the new club including the server rooms... yes, rooms, plural. More than one room is used to house the 17 streams of 4K that shoot out to dozens of areas of the club and facade from a plethora of Hippo Media Servers, that includes (8) Hippotizer Montane+ servers and (2) Hippotizer Boreal+ servers. All servers are running Hippotizer V4.5 Beta Software, which Green Hippo will be showing at InfoComm and releasing sometime thereafter, and they developed two new accessory cards and several new features specifically for this project.

Speaking with Cory, he talked about the moment he first learned of the new gig saying, "NTA came to me back in late August/early September of 2018 letting me know about the job and the requirements involved, and we just kind of went from there. I put together a preliminary hardware list for the servers, then they'd add a screen or two, and we'd re-adjust the server count and distribution. Then the design team said they wanted to incorporate Notch software into the system, so I re-configured the gear again to use Hippotizer Montane servers. During this entire process, I was going back and forth with the various LED providers to come up with the output maps as well as the various production teams for all the resident DJ's in order to come up with content templates for their systems. I was also involved with specifying a control system for the Hippos, and I went with a MA3 Full size console. Additionally, I worked with the guys at Niscon (a





Kvant lasers scan the audience at times.

Grand opening fireworks light up the sky.

provider of motion control systems), as they were writing custom software for the Raynok automation system to allow them to handle this many moving video pieces, and to send us the center point of the moveable video wedges instead of me having to do the math to figure out the resultant angle and rotation based off the position of each individual motor."

Cory continued, "Once we had a gear list nailed down, it was time to start actually figuring out how to approach all the different workflows that the club requires on a day-to-day basis. Things like VIP entrance takeovers, bottle service cards, tracking the automation, passing the automation data into Notch, all the pixel mapping, etc. We quickly discovered that nobody had actually drawn the venue in 3D, so Aiden and I had to create 3d models of everything from scratch, and I then had to UV map all the screen models to send off to the various content producers and notch artists so they could create content in 3D (To account for spatial relationships, and especially to account for all of the curves, since very few of the screens are actually flat.)

"After that, it was just creating all kinds of different templates for the guest artists to use. Some were gearing up for festival season and wanted to be able to play their festival show files off their laptops, which obviously can't do seventeen 4K outputs. Some of the artists already had their own show files in other software, but the way the club operates, they had to be taken into Hippo as a live input, so we had to make sure that we had templates in place to take advantage of the software and hardware they were using (if they didn't want to program their show in Hippo and feed all the screens at their native resolution)."

Cory finished by saying, "We also needed to add a few features to Hipptizer to achieve some of the stuff Palms was asking for, and that needed to be tested and vetted before I got onsite. We tried to get all of that done before I got onsite so that we could focus on programming the space as soon as they were ready for me to come in. The original plan was to have 4-6 weeks with the room, but as is always the case with new construction on a project of this scale, everything was behind. I arrived in Vegas three weeks prior to opening, and didn't really get the full system running until two days before the grand opening, so it was a sprint in terms of programming, but we got it done smoothly, all things considered. We spent the next two weeks polishing things, handing over to the club staff, training, etc., and that was that."

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AES provides the special FX.



DJ Kaskadee plays a set.

» **Special Effects**

A truly unique feature that must be experienced is the six-part mirror ball themed custom Tesla coil, set above the heart of the dance floor, which adds a production element unlike any other. With Midi Codec programming for arc pitch, length and directional control, this allows the system to “play” a song.

In addition to the tesla coil, a vast amount of customized special effects gear was installed into KAOS by Las Vegas based special effects company Advanced Entertainment Services. AES President Matt Dillingham along with Ferritta Entertainment Director Aiden Kemp spent nearly a year designing the layout, mechanical, power and control aspects of the special effects package. Matt describes the goal of the project saying, “Aside from selecting equipment that produced the desired effects we wanted, we needed to consider operational costs, including materials and labor, over the long term.”

Installation began in January and Dillingham says, “We are still adding more gear into the mix as well as dialing in the system in order to operate perfectly. There is a wide variety of effects that have been tailor made for this job, such as our AES custom designed water cannons that shoot eight gallons of water over 150’ as well as the laser system. Some of the lasers have been outfitted with special filters to allow audience scanning.”

The Kvant laser package and control software was provided to AES by Pangolin which included (4) ATOM 20 Lasers, (4) Clubmax 3000 Lasers, (5) Clubmax 10 Lasers and (6) LogoLAS

Lasers. All of the lasers use Pangolin Beyond software coupled together with a MA Console for control. Speaking with Justin Perry of Pangolin, Dillingham praised the install stating, “Once complete, it will be the first hotel on the Vegas strip, and first in the USA, with a fully turn key audience scanning display. Really ground breaking stuff.”

Regarding the gear package, Matt commented, “As far as atmospheres, we are using seven Antari M7 Smoke Jets mounted to the top of the outdoor main stage shooting down, and four more on the ground shooting up. In total there are 35 smoke jets, all fed from a fluid delivery system. There are also several Unique 2.1 Hazers from Look Solutions, fed from a central tank, and 20 Pyrotek Effects moving flame heads mounted on the roofs surrounding the club. Additional gear we installed are Ultratec FX Air Cannons for the confetti and streamers, as well as multiple Vario Aqua Fog units. All of this gear is routed through Interactive Technologies Cue Servers and MA Consoles, which allows us to test and control via an iPad or laptop. On top of that, we are using approximately 60 Doug Fleenor relays and 12 opto-splitters for additional control combined with several e-stop locations in order to safely stop the FX in the event of an issue or high winds.”

Matt went on to describe the install stating, “During the install there was extensive work performed with regards to plumbing and power to make this all happen. In addition, the IT and network integration that was handled by National Technology Associates was consid-

erable. A tech crew is supplied during the day to top off all fluids, and a separate crew works during the evenings to monitor and reload the FX. Combined, there is AES technicians onsite from 8am to 3am every day handling all aspects of the visual effects gear. Paul Chadwick served as our Lead FX Tech and led the installation of all special effects gear for this project.”

When asked if there were any unforeseen surprises, Matt smiled saying, “During the initial install and testing phase we fired both the water and flame cannons at the same time, and it created an excellent unintended effect.” (That effect is now part of the regular programming.) Matt finished, “AES was created in

1981 here in Las Vegas, and has been involved in hundreds of productions during that time. While we are a worldwide company, we take special pride in being part of projects that take place in our hometown. I personally take that a step further, being a Las Vegas native. My family settled here in the 1930s, and I am proud of Las Vegas and the entertainment industry it has created.”

Another company, Salvin Design, was brought in to handle the design and installation of the CO<sub>2</sub> system. The CO<sub>2</sub> effect system utilizes 32 Salvin High Output DMX CO<sub>2</sub> jets across six zones. Control is handled by Salvin’s Big Easy DMX show buttons. **PLSN**

**Lighting: A Q&A with Steve Lieberman**

Heading up the theatrical lighting aspects of KAOS was legendary lighting designer Steve Lieberman, and his company SJ Lighting, which provided all the lighting and control systems for the new club. SJ Lighting is a design firm based in Southern California specializing in theatrically based design for nightclubs and festival environments. Formed in 2001 by industry veteran Stephen Lieberman, SJ Lighting is at the forefront of entertainment technologies. We chatted with Steve and asked him a few questions regarding his latest design:

the system could accommodate an amazing light show; but that it could also cover the tasks of lighting the details. What that means is that when there are performers, either on stage or anywhere else, that the design supports these features. KAOS has contracted with some of the biggest DJs and artists in the world with residencies. Each artist is bringing in their own technical staff to program and operate their respective shows, and the system is designed and programmed to accommodate those requirements.”

**What was your role in the KAOS lighting design, install and programming phases?**

“SJ Lighting was contracted as the theatrical lighting consultant as part of the design team. Additionally, we provided all theatrical equipment, prepped it in our shop and delivered it to the field. All the control racks were built and tested in Westlake village before shipping out. I was assisted by Ben Rehm, who also works with me at SJ Lighting. Installation was provided by In-House Productions and systems integration was handled by National Technology Associates.”

**Was there any unique use of fixtures/programming on this club install?**

“There are several bespoke details of this venue. Custom built motion controlled “pods” move up and down throughout the space. There are over 100 axis of motion that all have lighting details. Everything from LED tape bordering the panels, to custom chandeliers housing moving lights.”

**What were the factors involved in your vision with the design/programming itself?**

“KAOS is one of the most ambitious projects we’ve ever worked on. The design was a collaboration between SJ Lighting, Rockwell Design & Stations Casino. The design aesthetic and philosophy needed to be avant-garde while at the same time very clean and precise. As the theatrical lighting consultant, we needed to make sure that

**What is so special about this club versus the other clubs you have programmed?**

“KAOS has spent a lot of time and effort in making sure every detail of the venue is cohesive. The LED wall follows the contours of the building; the theatrical system fits perfectly within the architecture... no detail has been left out. The control systems are networked together so that the operators can maintain order throughout their show, and this will be noticed anytime the venue is in operation. The choreography between lighting, video and special effects is seamless.”

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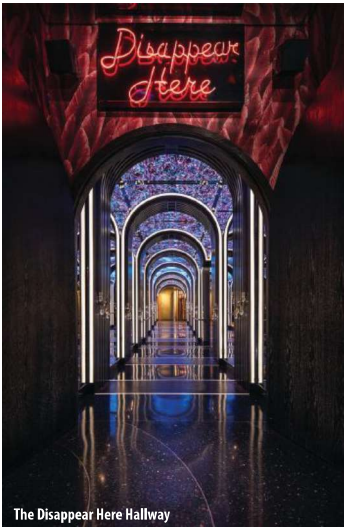
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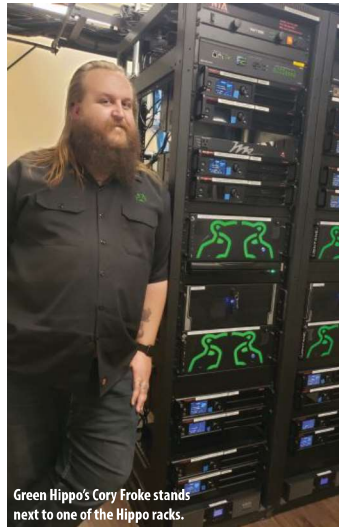




Partying at the dayclub.



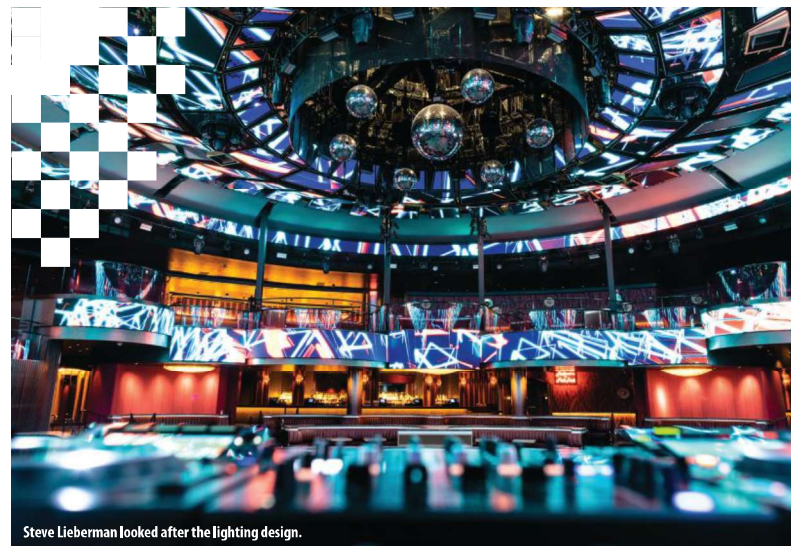
The Disappear Here Hallway



Green Hippo's Cory Froke stands next to one of the Hippo racks.



Salvin gave a hand installing the CO<sub>2</sub>.



Steve Lieberman looked after the lighting design.

**Video Gear List:**

**Green Hippo Gear:**

- 8 Hippotizer Montane+ with 4 3GSDI Capture, 2 HDMI 2.0 Capture, and 2 additional 10G Ethernet
- 2 Hippotizer Boreal+ with 4 3GSDI Capture, 2 HDMI 2.0 Capture, and 2 Additional 10G Ethernet

**NanoLumens Gear:**

- 9300 2.5mm Standard, Custom and Curved LED Panels

- 112 4mm LED Panels

**Yaham Gear:**

- 1624 4mm LED Panels
- 1035 25mm LED Panels

**Control Gear:**

- 1 grandMA3 Fullsize

**Lighting Gear List:**

- 2 grandMA3 Full consoles
- 44 Robe MegaPointes
- 16 Robe iPointe
- 6 Robe Pointes
- 21 Robe Spiiders
- 3 Robe LEDBeam 150's
- 70 Ayrton MiniPanel FX
- 24 GLP JDC1 Strobes
- 22 Chauvet Strike 1's
- 16 Chauvet Maverick Storm 1 Washes
- 3 SGM P-6's
- 22 Martin Atomic 3000 LED strobes
- 89 Martin Graze 310's
- 100 ArcSource Outdoor 4MC's

**Rigging/Staging/Trussing:**

Provided by Pat Bash, president of

**In-House Productions**

**Special FX Gear List:**

- 12 AES Kraken water cannons
- 4 Antari AF-3 DMX fans
- 35 Antari m-7 smoke machines
- 35 Antari LCU-1 fluid pump systems
- 2 Artistry in Motion Mini Blasters Clubcannon CO2 jets
- 6 Cueserver show control modules
- 51 Fleenor 1 channel relays
- 8 Fleenor DMX optosplitters
- 6 Kvant Logolas 6w laser units
- 4 Kvant Atom 20 20w laser units
- 4 Kvant ClubMAX 3000 3w laser units
- 5 Kvant ClubMAX 10 10w laser units
- 2 Look Solutions Unique 2.1 hazers
- 2 Magicfx Stadium Shot air cannons
- 20 ProFX flame waver heads
- 28 Salvin CO2 jets
- 2 Ultratec FDS systems
- 10 Ultratec air cannons
- 2 Vario 8 Aquafog heavy fog units

**AES Install & Operations Crew:**

**Head Electrician and Crew Chief:**

Paul Chadwick

**Operations Crew Supervisor:**

Joe Grossman

**Flame & Water Cannon Systems**

**Engineer:** Tom Gittens

**Laser Consultant/Programmer:**

Jamie Goodwin

**Crew:** Ivan Hernandez

**Crew:** Justin Dillingham

**Crew:** Brandon Dembs



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