

smoke & mirrors

anatomy of **nights in white satin: the trip**

By Martin Palicki

Lewis Carroll may have provided the first backdrop for a psychedelic dark ride when Alice in Wonderland opened at Disneyland over 50 years ago, but the references are subtle and questionable. In 2008, however, The Moody Blues laid claim to the first openly hallucinogenic theme park attraction, with the opening of Nights In White Satin: The Trip at the new Hard Rock Park in Myrtle Beach, SC.

If the moniker “The Trip” isn’t convincing enough, one need only look at the ride’s entrance to confirm the suspicion that this attraction, just like the park it calls home, truly is like no other.

Hard Rock Park co-founder and industry veteran Jon Binkowski began his career in theme parks at San Diego’s SeaWorld, working for pioneer George Millay before starting his own company and making the rounds with Universal Studios and Disney. September 11th and its subsequent financial crunch led Jon to focus on a movie theater he owned in Myrtle Beach, where an outlet mall, once dominated by retailer Waccamaw, was slowly drying up. He partnered with several investors to purchase the mall and nearby property surrounding a small lagoon. Jon began to plan a theme park for the property, and after finding business partner Steve Goodwin, decided on pursuing a rock-n-roll themed park. After convincing Hard Rock executives to license their brand for the park, Jon got to work on developing the park’s arsenal of attractions.

Several roller coasters, all with on-board audio, creative shows, and an excess of clever theming came together to form the first Hard Rock Park. According to Binkowski, he knew he wanted a dark ride for the park, and one that was based solely on one song. Utilizing a portion of the former outlet mall, located in the park’s British Invasion section, Jon considered selections from The Beatles and Pink Floyd before settling on The Moody Blues.

“Nights In White Satin had everything the ride needed: interesting effects, a rock’n’roll sound, and great orchestration,” said Binkowski. “It really was a no-brainer.” With the song selected, Jon approached Sally Corporation’s John Wood for the company’s help in designing the ride. Sally has created countless dark rides, from the comic Scooby Doo black-light interactive rides found in many theme parks to the impressively themed Challenge of Tutankhamon at Walibi Belgium. But this was a different type of dark ride than they were used to.

“We had always wanted to put a ride to music,” recounts Wood, “but this was an unusual [project] for us...no animatronics, no interactivity, and very little scenery.” In fact, Binkowski had been adamant about the ride’s format. Like the song, Jon wanted the ride to be a collection of experiences, of sensory stimulation, rather than a narrative progression, and he admits that he wanted the ride to be accomplished with essentially just “smoke and mirrors.”

Sally took Binkowski’s vision for each scene of the ride and translated them into a layout and schematic for the attraction. But with Sally’s forte in scenic and animatronic areas, John turned to Attraction Design Services (ADS) to handle the extensive AV systems necessary to bring the song to life.

Nights In White Satin, Never Reaching The End

The ride system, provided by Holland-based ETF Ride Systems, contains sets of two six-passenger slow-moving ride vehicles that travel together through the ride course, but are not connected. Riders are given a pair of ChromaDepth, 3D glasses, seated, and whisked into the first few scenes of the ride, while the song starts. The first scene sets the mood and is perhaps the most literal throughout the ride. White “satin” sheets drape from ceiling to floor,

billowing slowly in the wind, while a collection of images is rear projected onto and through the sheets.

Frank Fruscello and Kenneth Eff from ADS worked with all the AV equipment throughout the ride, and explain that even a simple scene such as this had its challenges.

“The satin sheets are actually a Rosco projection silk material,” said Eff. “We tried a variety of fabrics, but this gave us the best quality and the precise ‘billowing factor’ we were looking for.” The billowing was in itself tricky. The fabric is mounted to poles that run the height of the room, and needed to flow freely in a dream-like slow-motion wave, without getting into the ride vehicle’s path.

“We needed oscillating fans that had a variable speed of both oscillation and velocity, independent of one another,” said Eff. Such a product did not exist, so the team created their own oscillation systems to achieve the proper effect. ADS uplit the fabric with blue lights and downlit with purple lights, so that the fabric appears to change colors and shimmer as it moves back and forth.

Because of the small space between the scene walls and the ride path, digital video projectors were mounted vertically and bounced off mirror assemblies to save space. ADS tried a variety of filters to reduce the glow from video black and prevent the images from being framed out. Eventually, the right luminosity was achieved, but the problem would repeat itself again and again in the attraction.

Letters I’ve Written, Never Meaning To Send

The cars next follow a fiber-optic trail of lights into the next scene, where they face a bleak and barren landscape scene, created by Sally’s team of artists. Three louvered Wildfire

*Editor’s Note: This article was originally written in 2008 for **Lighting And Sound America** magazine and published here with their permission. When Hard Rock Park closed, the story was tabled. Until now, it has never been published. A new dark ride has replaced **nights in white satin: the trip** at what is now called Freestyle Music Park, but it is decidedly less “trip”-y.*



Under white light, the scene of barren and wind-blown trees appears to guests behind a fiber-optic grass field. As the scene transitions from white to UV light, a colorful world emerges on the once-barren landscape. COURTESY OF SALLY CORPORATION.

backlight units open to reveal a full color psychedelic overlay to the scene, painted with invisible UV paints.

"We wanted an even luminosity with the three UV lights, and a gentle fade from white light to UV," explained the attraction's lighting designer Greg Randle of X-nth Gallegos Lighting. To achieve the transition, the white lights dim to zero while the dousers on the UV lights open. Additionally several rotating gobos illuminate to give the scene a feeling of motion.

The cars then spin and pass a series of fluorescent three-dimensional 60's style "Op Art" objects. ADS got the idea for some of the spinning objects after seeing a kiosk in a mall selling hanging backyard ornaments that rotate and appear to change shape. The attraction's versions are much larger in scale and are accompanied by several mirror frame boxes, which appear to be empty from one angle, but change to full as the cars pass by. To draw attention to the effects, ADS created three different zones of Chauvet Shadow LED UV lights that light up and dim as guests pass.

Beauty I'd Always Missed With These Eyes Before

As the cars move into the next scene, four gobo images, chosen to make use of the ChromaDepth, 3D glasses, sweep across the guests as the vehicles rotate and turn to reveal projections from several Martin water & oil units.

"The water and oil units cannot be dimmed," said Fruscello, "and that provided a big problem for us because the luminosity, combined with

the light bleed from the units, lit up the scene way too much." Since the room was essentially just an empty box, the guest's focus needed to be directed solely on the projections. To solve the problem, ADS built dousers around the light fixtures and outfitted them with polarized filters to darken the projections.

The cars rotate to a video projection on the opposite, curved wall. Binkowski's plan called for an Austin Powers-esque dancing silhouette encased within a wavy liquid environment. The background's colors change throughout the projection as the dancing girl fades in and out of view.

ADS created the projection, after several attempts at color combinations, dancing girls, and CGI animations. Once the final animation was settled upon, the curved wall still had to be dealt with. Ken and Frank utilized a specialized lens to adjust for the curvature of the projection surface and decided on the more cost-effective and easily-installed Screen Goo product.

Just What The Truth Is, I Can't Say Anymore

At this point in the song, there is an extended orchestral interlude, with dramatic crescendos and cymbal crashes. The cars turn towards a blank wall and at the proper moment, an illuminated smoke ring shoots at the car. Moments later, the second car in the pair is hit by a second ring.

While the technology to create smoke rings is not new, ADS found that current systems were unable to perform as needed. With about 25

feet between the effect and the cars, the smoke ring needed to form almost immediately.

"Most smoke rings take almost 25 feet to fully form, but we needed it to come together as soon as it exited the barrel," explained Eff. The team used a pool lining material for the piston to push against, and a specialized fog fluid needed to be developed. ADS approached Jeff Wade at Back Stage Technologies to address some of the challenges.

"We had several big problems with this scene," said Fruscello. "The first and most easily fixed was with the HVAC system. We had to shut off two vents in the room that were disrupting the path of the smoke ring. Secondly, we needed to be able to quickly refill the smoke chamber as the effect had to fire for the second car passing within seconds of the first trigger. Finally, the sensors on the ETF ride system were detecting some of the particulate from the fog, interpreting it as something blocking the ride vehicle's path and shutting down the attraction."

ADS developed their own "secret blend" of fog juice that refilled the chamber quickly, and dissipated sufficiently before falling to the ride's sensors. A series of bullet spots were also timed to illuminate in succession and follow the smoke ring during its 25-foot journey.

The cars round a corner and a fiberoptic trail above them cascades across the ceiling and down the walls to illuminate over 100 candles, in real wrought-iron candelabras. The candles were separated into several banks of DMX controlled dimmers that create the twinkling effect, while nine panels of fiberoptics carry the "spark" that brings the room to life.

Skirt lighting along the floor illuminates low lying fog that was also specially mixed to keep it from being too dense and setting off the ride vehicle's sensors. At the end of the hall of candles, one candle's smoke wafts into the shape of a human face as the cars pass by. The effect is a sort of Pepper's Ghost illusion, utilizing an NEC short throw projector bouncing the image off of a sheet of Duvateen.

"We tried a whole variety of materials to eliminate the black glow and projection frame, including wood, screens, and then finally using a lens filter and Duvateen to get the proper effect," explained Eff. A 30% mirrored glass reflects the projection to guests in front of the candle prop. "When you think about it," said Eff, "smoke is one of the hardest things to project because it is so transparent and the contrast between it and darkness is almost non-existent."

'Cause I Love You, Yes, I Love You

As the cars move away from the candles, a laser tunnel is created above them, and a series of strobe lights flash to disorient guests. As the cars enter the next scene, a starfield twinkles above and a cosmic maiden appears on a fog screen that the cars pass through. Original designs from Sally included an animatronic maiden in this scene, floating in space, who turns to guests as her face morphs into a

skull. The teams explored ways to make the effect real, including a projected face onto a mannequin, similar to the Madame Leota effect at the Disney Haunted Mansion attraction. But Jon Binkowski resisted the figure, saying he didn't want anything that tactile within the attraction. The cosmic maiden was okay, it just had to be more ethereal.

ADS and Sally didn't just want another projection, though, and looked for more of an encounter with the maiden, rather than just riding past her. The team settled on projecting the maiden, complete with her skull-morphing face, onto a fog screen. They looked at purchasing a fog screen similar to ones used at Disney's Pirates of the Caribbean, but everyone was concerned about the moisture output, especially as the fog fell to the floor and near the ride sensors.

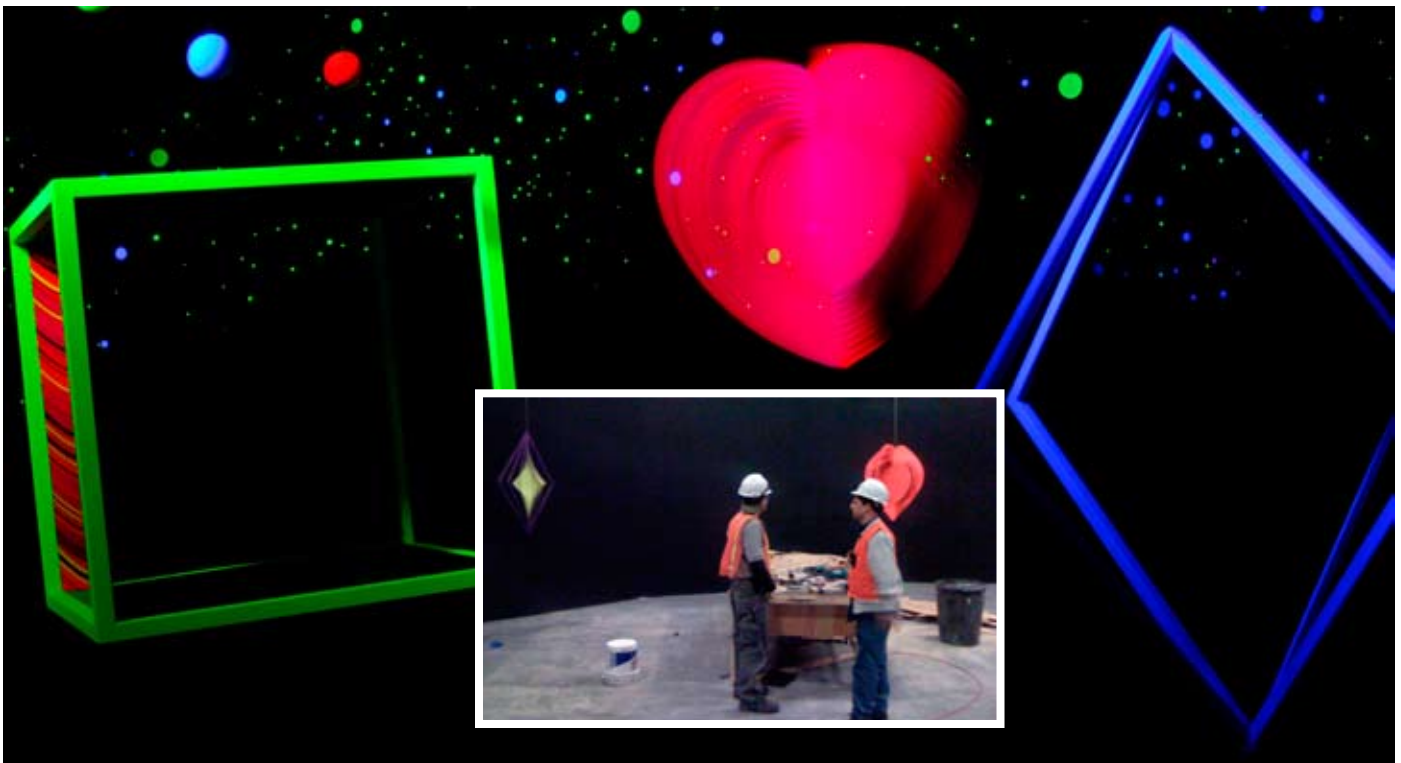
Ken and Frank worked with the group to implement a new system, one they refer to as a Thermal Screen. It was the first time it was used in a theme park application, having been primarily created for military training and advertising. With slight modifications, the Thermal Screen was able to create an effective fog screen with only 10% of the moisture of a traditional system. Additionally, the Thermal Screen creates a far smaller particulate that enables the image to appear without an apparent surface.

As expected HVAC equipment was adjusted to keep the flow of fog uninterrupted, and when asked if the draft created by the first car passing through the screen affected the second car's view, Ken and Frank agree it was a "happy accident" that the fog fell back into place quickly enough to reset the screen for the second car.

Breathe Deep The Gathering Gloom

The next few ride scenes are accompanied only by dialogue, a poem written by The Moody Blues called "Late Lament." The ride vehicles enter an elongated ellipsoid shaped room where a video projection surrounds the ride vehicles as they move forward. The effect has been called a speed room and has been used successfully in attractions for many years, but this was the first time a 65-foot projection tunnel had been attempted. The long, domed space is an unusual shape: think of the front of an airplane, with the ride vehicles entering the back of the cockpit and out the nose of the plane. The team looked at using inflatable screens, but decided that using drywall to create the space was the most effective route to take. Screen Goo was selected to cover the walls, although the fire marshals considered the dome part of the building structure, and required full sprinkler coverage inside, causing some headaches, and blemishes to the surface.

Spinning art and mirror-boxes are illuminated by dimming Chauvet LED UV lights as cars pass by. COURTESY OF SALLY CORPORATION. Inset: Workers plan the installation of the "Op-Art" room to best keep guests drawn into the ride's mind-bending illusions. COURTESY OF ATTRACTION DESIGN SERVICES.



In this artist's rendering of the endless candle scene, candles flicker thanks to nine dimmer units, while ghostly faces arise out of the candle's smoke at the end of the room, thanks to projectors and Duvateen. COURTESY OF SALLY CORPORATION.



ADS considered a 75mm projector, but the budget did not support that. They looked at using multiple projectors, but had difficulty locating the projectors inside the space. The solution: one mega-projector at the back of the dome that projects 180-degrees through the 65 ft long and 18 ft high space.

"We had to grind a custom lens to adjust for the unique curvature of the space," said Eff, "and that alone ended up being 40% of the cost for the room."

ADS also developed the media for the room which changed as the project progressed and early envelope-pushing scenes had to be toned down for wider audience appeal. But the bigger challenge came in adjusting the media to compensate both moving cars. The difference in perspective between the two cars traveling together was significant enough that the team literally moved the cars and the film forward frame by frame and manually adjusted the perspective to give the best appearance to both cars, a process ADS refers to as "real-time distortion." The end effect makes guests feel like they are moving much faster than they are, along with the speed of the film. Original plans included floor fans to accentuate the feeling of movement, but the room turned into a noisy wind tunnel that covered up the audio throughout the ride.

The next scene focuses on an image of the moon, whose craters shift and bubble up like a lava lamp, until the moon "explodes" sending a concentrated mist of water on each car. ADS wanted more of a scenic impact and convinced Binkowski to try the very tactile effect of

flying in lava blobs from above. Two simple contraptions drop down a series of Styrofoam balls on the end of wires, while a piston strikes the unit, causing the balls to shake. Originally, ADS lit the room with UV lights, but found the best effect was achieved with red balls and a red filter on a strobe light. The lava blobs, while simple in design, appear suspended in and floating through space. Binkowski liked the effect, and it stayed.

The music then picks up again for the final instrumental chords and doors open to the final scenes. Ten mirror balls at varying heights and sizes were illuminated by blue and yellow lights that changed to bright white as the cars spun around beneath. A hazer in the room provided enough particulate to make the balls shine without tripping ride sensors.

Unfortunately, the haze kept spilling out into the unload platform, and for safety reasons, the park changed the final scene to make it a blacklight poster-come-to-life.

As the cars pull into the unload, the final gong sounds as air cannons blast each of the cars and a simple strobe light spiral activated by an American DJ controller surrounds the riders.

But We Decide Which Is Right, And Which Is An Illusion

"Working with a ride tied exclusively to a song was a challenge," said Fruscello. "A typical ride's narrative actually allows for more variation, but with the song, there were effects tied to specific musical events, that even guests unfamiliar with the song would recognize as amiss if not timed perfectly."

To achieve the best audio environment, acoustical consultant Thorburn Associates was brought in to recommend dampening compounds for the ride vehicles to ensure a full sound. Thorburn also improved speaker wiring in the cars for better localization of sound and made equalization recommendations.

Point source audio is found in various scenes throughout the ride and synchronized with the onboard audio via an Alcorn McBride controller. Initially, ADS looked to having the whole ride controlled by synchronized SMPTE code, but opted to have each scene's effects triggered by the ride vehicles, and the result has been just as good.

Guests have given Nights In White Satin: The Trip favorable reviews and many consider it to be the park's star attraction, even though it's overshadowed by tall, imposing roller coasters, and is altogether difficult to describe to others.

You might think the founder and director of Darkride And Funhouse Enthusiasts (DAFE) Rick Davis would have an upper hand at capturing Nights In White Satin, but even he finds it challenging.

"Mere words cannot describe this ride," says Davis. "No, ride is the wrong word for it. This is a dark experience." It's an experience unlike any other... even if it is just an illusion of "smoke and mirrors."



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