

# Lighting on Safari

## *Revisiting Animal Kingdom*

The safari vehicle heads into darkness as a single searchlight scans the path ahead. The guide directs the tourists to look across the river, where alligators often are spotted, and the light pans to illuminate the large reptiles. A few minutes later, the searchlight guides the visitors' gaze toward giraffes, and later, elephants, rhinos and lions. It's not Africa, but it's as close as U.S. tourists are going to get without leaving the country. It's Disney's Animal Kingdom at the Walt Disney World Resort near Orlando, Fla., and its safari promises a glimpse of an African landscape with minimal interference from specialty lighting and other effects.

"The safari track goes through 100 acres of land, and there are many lighting issues for nighttime performances, from the landscape to the animals," explains David Taylor, principal show lighting designer for Walt Disney Imagineering. "African safaris don't have lights in the landscape, so to keep the experience as realistic as possible, I decided to have the lighting work off the vehicle, just like it does on an actual safari."

Taylor needed fixtures that could pan and tilt, be mounted on outdoor vehicles, survive the rugged terrain and sometimes harsh Florida weather — and continue to work reliably. He approached a number of industry manufacturers to create these fixtures, but none could address the challenge — until he began working with Light & Sound Design (LSD) in early 1996. Today, more than three years after the theme park opened, the fixtures LSD created continue to function flawlessly.

### Sturdy and dependable

Taylor and LSD equipped 27 safari vehicles with custom-designed automated yokes fitted with Altman Star Pars. To create the custom yokes, LSD modified the design of its Icon Washlight® yoke to withstand the constant bouncing of the safari terrain and the continuous exposure to the elements.

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## Color Us Pleased: *Wybron CXI and Color Kinetics iColor*

### Wybron's CXI maximizes color options

The CXI ColorFusion rounds out Wybron's well-known family of color scrollers. The CXI is an advanced scroller with a two-gelstring cyan, yellow, magenta color-mixing system that

allows designers to create virtually any color and saturation they want — and fine-tune it on the spot. And because the CXI uses only two scrolls, the light output is bright and smooth.

In addition to matching the most commonly used gel colors from leading manufacturers, designers can create their own

colors or use Wybron's CXI Color

Calculator to find the exact hue they want. The CXI, available in 4-inch, 7.5-inch and 12-inch models, as well as a weather-resistant model called the Mariner, fits most common lighting fixtures and runs on the Coloram II power supply.

### Color Kinetics' ever-changing hues

Color Kinetics' iColor™ Series is a family of compact, digital color-changing lighting products that uses Color

Kinetics' own Chromacore™ technology to expand designers' ability to use color in architectural applications. Chromacore technology uses microprocessor-controlled RGB LEDs to generate more than 16.7 million colors, and its built-in intelligence allows for a variety of color-changing effects, including color cross fades, color washes, random color changes, chases and strobes.

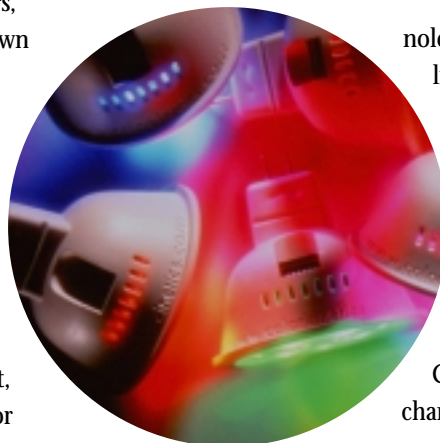
iColor MR is the same size as a standard MR16 lamp, and designers can use it as a replacement lamp for any existing low-voltage MR16 fixture. Simply pop out the white or halogen light source, replace it with iColor MR, and color control and effects are at your fingertips.

iColor Cove puts the same technology in a linear format. The Cove light fits into tight spaces and can be connected to fit around curves or used in alcoves and accent areas.

iColor Series products can be controlled externally via PC, DMX512 or a range of controllers available from Color Kinetics. Effects also can be changed by setting built-in switches.



© Wybron, Inc.



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### Lights Up! Lighting Balloon

The helium-filled Lighting Balloon from Lights Up! Industries floats over sets, trade shows and other venues, providing soft, even light wherever needed. The balloons come in a variety of sizes and with a number of different light sources. The circular balloon models come in a 6-foot diameter unit with four 1,000W tungsten lamps, a 12-foot diameter unit with eight 1,000W tungsten lamps, a 12-foot diameter unit with four 1,200W HMI lamps and a 16-foot diameter unit with four 4,000W HMI lamps.

The company also offers two tube-shaped balloons for use in space-constricted locations: a 6.5-foot high by 13-foot long unit with eight 1,000W tungsten lamps and an 8.5-foot high by 18.5-foot long model with four 1,200W HMI lamps.

The lighting balloon is ideal for television shoots, such as town hall meetings, church services and other events, held in locations that require lighting a large area — but in which conventional rigging methods might be impractical or might damage the facility. Of course, the balloons are very easy to reposition. Users also can silk screen a company name or logo on the balloon and use it for trade shows and other marketing applications.

## Large-Format Projection Meets All Size Needs

The Ohio Ballet used one Ludwig Pani projector to explore the universe, and this single 2.5kW HMI unit — the workhorse of the Pani product line — took audience members from Mercury to Neptune. This powerful use of just one large-format projector reflects a growing trend in the industry: a medium well known for large-scale uses is becoming more and more popular for smaller projects — and smaller budgets.

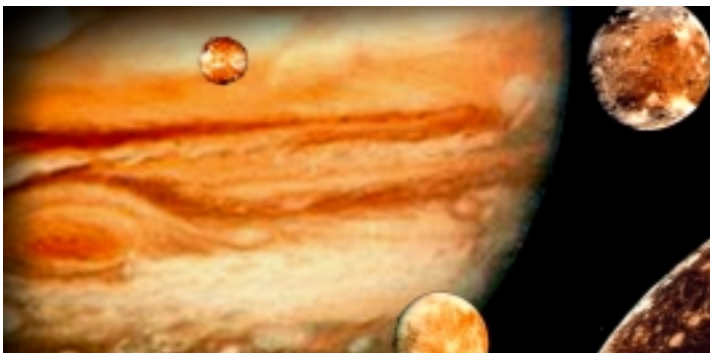


Photo by Kevin Hardy

### Universal appeal

Kevin Hardy, lighting designer/environmental control for the Ohio Ballet, worked in conjunction with NASA to set the stage for the ballet's production of *The Planets*, based on Gustav Holst's symphony of the same name. The ballet has seven sections, each named for a planet in our solar system. NASA gave Hardy access to its photographs, including images from the Voyager and Viking expeditions, and he modified them to create the artwork for the projection slides.

Hardy used upstage and downstage scrim as projection surfaces. The dancers appeared from behind the scrim, and then the scrim flew out.

"Jeffrey Graham Hughes, the artistic director for the Ohio Ballet and choreographer for this ballet, wanted a sense of movement," Hardy explains. "So we used a series of images for each section. For Jupiter, for example, we started with a faraway shot that showed the planet and its moons, then moved to a closer shot of the planet, and ended with a shot of the surface. And we did it all with one Pani equipped with a slide changer."

Hardy, who had never worked with large-format projection, was enthusiastic about the results. "I loved the Pani and

had no trouble whatsoever. The integration with the lighting console to operate the slide changer was painless," he says. "And Production Arts provided outstanding support. Now I'm looking forward to doing this kind of work again."

### Brightness that punches through

Scott Mirkin, president of ESM Group, a Philadelphia-based production company, used a single 2kW Pani projector for a three-day industrial for Rohm and Haas, one of the largest specialty chemical companies in the world.

"It was a three-day meeting, and I used the projection to change the look of the main background," Mirkin says. "I thought the Pani was great. In today's world, everything seems to be digital, and it was refreshing to use film, which is still the best-looking medium out there."

Production Arts helped Mirkin select the projector that best suited his needs, worked with him to determine the best placement for the equipment and taught him how to prepare artwork for the slides. When the art was ready, Production Arts also created the slides.

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Mirkin says that after seeing the projector in action, he knew it would be a powerful presentation — for both the on-site audience and the cameras that taped the event. "There wasn't even a question about the brightness," he says. "We were using the lowest-wattage Pani available, and it did exactly what we needed it to do. It punched through for both the audience and the camera.

"It wasn't a large project for Production Arts, and they still spent a lot of time with us," he adds. "They were there every step of the way."

“The Altman pars fit right into the LSD yokes, and the yokes provide the pan and tilt we need,” Taylor says. “And they look good on the tops of the safari vehicles, too. They fit right in with our theme.” One automated searchlight is mounted on the front of each vehicle, and four fixed floodlights are mounted on the sides — two on the left and two on the right.

Taylor and LSD worked quickly to have the custom fixtures ready for the theme park’s debut. By the time Animal Kingdom opened in April 1998, however, it had been decided that the nighttime safaris would be offered only during the December holiday season.

“From the time we opened in April until the first performance in December, the LSD yokes took all the abuse of the Florida sun and rain as well as the bumpy ride around the trail all day long. But since we were doing only daytime safaris, we never used the fixtures,” Taylor recalls. “The

**“The LSD yokes took all the abuse of the Florida sun and rain as well as the bumpy ride around the trail all day long. The weather alone was enough to destroy the units, but they worked like a charm.”**

### Programming for the unpredictable

Programming the lighting for a live show is tricky, particularly when the star attractions are untrained animal actors appearing in their natural habitat. Taylor installed a series of “pucks” in the track to relay signals to the safari vehicles and preprogrammed the automated fixtures to work from these markers.

“There are pucks in the track every 50 feet, and each transmits a discrete ID back to the vehicle,” he says. “Antennas attached to the vehicles pick up each puck’s signal, which tells the vehicle where it is and triggers the lighting cues.” While no one can predict exactly where the animals will be, Taylor’s system knows where the vehicle is on the track and where the lights are relative to the animal habitats.

For each point in the safari, Taylor programs the searchlights to scan the general area where the visitors should look — to the left of the vehicle, across the vista on the right, etc. “The searchlight attracts the attention of the audience and helps guide their eyes, but they have to look actively for the animals. The lights simply tell them where to look.” The fixed lights come up as the searchlight pans the targeted area. Then the fixed lights fade out, the vehicle moves forward and the searchlight scans the road ahead until the next cue.

“The intent is for it to be wide open and as realistic as possible in the tradition of today’s zoos,” Taylor adds. “Visitors may not see every animal — but giraffes, rhinos and other animals also may cross the vehicle’s path and get close to the guests.”



© Walt Disney Company

weather alone was enough to destroy the units, but when we called upon them for the first nighttime performance, they worked like a charm.

“In fact, I had more problems with the fixed lighting on the bus than with the moving lights.”

After that first year, Taylor began removing the fixtures and remounting them for the December performances. “We put them back on the vehicles in 1999, and they still were functioning really well,” he says. “I trust that I can put them on the vehicles, and they will work.”

## De La Guarda

### *Conventional Lighting for Unconventional Theatre*

“You leave the Roundhouse unable for a while to return to normal. All you want is to indulge the primal urge to scream, howl and dance in the street.” This review in *The Independent* is a typical reaction to Argentine theatrical troupe De La Guarda’s production of *Villa Villa*, which finished its run at London’s Roundhouse theatre in April.

De La Guarda merges the talents of dancers, musicians, mountain climbers and others to create a spectacle that has amazed audiences on three continents. The group’s most recent production, *Villa Villa* (pronounced VEE-sha VEE-sha), begins with flying performers who are introduced to the audience from above.

The audience, standing in the center of a black box theatre, looks up at a paper ceiling. Only shadows of the actors, created with strong red, blue and green lighting on the paper ceiling, are visible from below — until little by little, they break through the paper, flying with the assistance of a pulley system. Other elements of the production include a storm — complete with an audience-drenching water sprayer, strobe lights and powerful fans for wind effects — and performers who seem to defy gravity as they move across the cyc. At one point, flying actors reach down to audience members, pick them up and carry them in flight through the theatre.

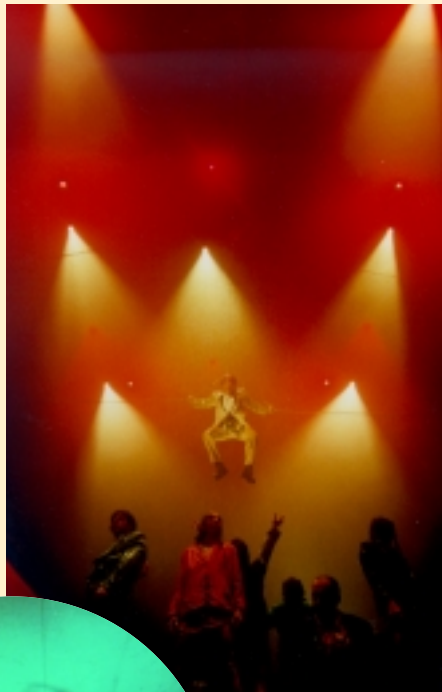
“The show is happening all around the theatre — on the air, on the floor and on the cyc — and the whole time, the audience is completely inside the action,” says Lighting Designer Charles Trigueros. “The feeling of the show is very live, and it’s important that the lighting support that feeling.”

#### Less is more

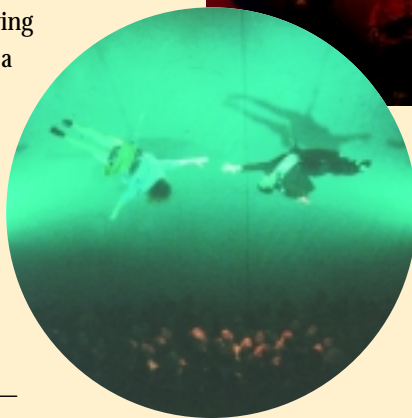
Trigueros’ lighting works in conjunction with the live action, and his effects for this cutting-edge, unconventional production are produced with some surprising lighting choices: every fixture in the show is conventional. There are no automated lights and no color scrollers — but there are lights that move. Lighting operators use hand-held lights to follow the performers’ movements.

“The aesthetic of the show requires only conventional lighting,” Trigueros explains. “We just want to light the action, and we want to be as realistic as possible. Moving lights can detract from the performers — and we don’t want the lights to be more than the show.”

Light & Sound Design (LSD) provided all the lighting equipment, truss and rigging for the production, as well as an installation crew. “I’m really happy with LSD, which is one of the best companies in the business,” Trigueros says. “LSD played a big technical role in the show. They understood what we wanted and worked with us instead of trying to change it. They responded really well to our needs.”



Photos courtesy of Diego/De La Guarda



#### Keeping up with the action

Each night, the actors influence the dynamic show, and the lighting operators must react to — and keep up with — their activity. The lighting effects rely heavily on these operators, which is just how Trigueros wants it.

“It’s important to have punctual light, because the show moves around so much,” Trigueros says. “We’re using the entire theatre, and the action changes every minute.” To create this “punctual light,” Trigueros uses hand-held par cans as followspots, giving the lighting operators more mobility and faster reaction times.

LSD modified eight par 64s to create hand-held par cans with in-line switches. Because these hand-held followspots aren’t mounted on stands, the lighting operators can track the performers more easily as they fly through the air, dash across the cyc and draw the audience into the action.

**Nasdaq MarketSite engages visitors**

Nasdaq rang in the millennium by opening its new Times Square location — Nasdaq MarketSite. The site, which includes a broadcast facility and a public interactive exhibit, is designed to give investors, tourists, schoolchildren and others the latest financial news as well as an inside look at how stock markets operate.

Production Arts, brought to the project by general contractor Barney Skanska and exhibit design firm Douglas Gallagher, integrated the lighting components and provided equipment, dimming and control, on-site coordination, and a crew to program the lighting.



The three-story, glass-enclosed broadcast facility includes a street-level studio that is used for market updates and other financial news reporting. Reporters from Bloom-

berg, CNBC, CNNfn, MSNBC and others broadcast more than 100 reports a day.

The public center is an educational and interactive experience that teaches visitors about the market and allows them to participate in interactive stock market games. Visitors enter the public center through a 50-foot tunnel, which has walls of perforated metal and eight bands of neon that cover about 240 degrees of the tunnel's inner surface.

“The idea is to show how data moves through a computer network,” explains Lighting Designer Ted Mather. The eight bands of neon begin with dark blue at floor level and move to lighter blues toward the ceiling. Each band of the DMX-controlled neon is installed in seven sections, creating one long line of neon that chases and pulses as visitors pass through it. In addition, fiberoptic tips of light are visible through the tunnel perforations and add a sparkle to the effect. The neon lights were supplied by Krypton Neon.

**Summer used equipment sale**

The PRG Lighting Group has one of the most extensive inventories of gently used, professionally maintained lighting and audio equipment in the United States. Our summer sale highlights High End System Studio Colors. Check out [www.prglighting.com](http://www.prglighting.com) for a full list of available equipment.

**Bar Code: high-tech gaming in Times Square**

Entertainment Development Group, Inc. (EDG) and E-J Electrical Installations, Inc. tapped Production Arts to supply lighting, dimming and control for Bar Code and Galactic Circus, EDG's next-generation interactive entertainment venues located in the heart of Times Square.

Bar Code is an interactive game bar with more than 80 computer and table games, including a wide variety of virtual reality games. Galactic Circus combines the nostalgia of old-world carnivals — including barkers, carnival games and prizes — with high-tech interactive games.

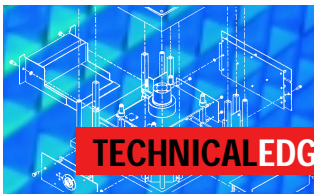
In addition to supplying equipment and support, Production Arts created a programmable lighting system for the three-level site that houses the two entertainment attractions. The system includes a Microlite Controllable circuit breaker panel that allows for control of individual circuits. With these circuits, all of the system's moving lights can be turned on and off without tying up valuable dimming circuits.

The system has two control components. Standard lighting cues are executed through an ETC Expression 3X Lighting Playback Controller (LPC) that is programmed with the run-time activities of a typical 24-hour operating day. For special situations, an associated ETC Unison control system links to the playback unit to trigger specific actions. Accessible through one fixed LCD station and one portable LCD station that can plug into any of five locations in the venue, managers can manipulate the lighting to fit unique situations. The Production Arts lighting system also ties into the audiovisual system — provided by PRG company SPL — giving designers the ability to program lights for special events. If a guest earns a high score on a game, for example, the lights go through a preprogrammed “dance.”



Photo courtesy of EDG

The lighting system, based on initial design concepts by Fabian Yeager, and field programmed by Design One Inc. of New York City, includes architectural and specialty lighting such as Roboscans, Imagescans, Studio Spots, strobes and Color Kinetics iColor Cove lights.



# Understanding the Changing Network Landscape

By Steve Terry

In the distant past — say six years ago — lighting systems were just beginning to embrace the possibilities of operating in a network environment. Early lighting networks were used to transmit console-specific data, such as remote video — and they were brute-force, bulk data movers that did not take much advantage of the tremendous power and flexibility that we take for granted in office networks. Today, all that is changing with work on the ESTA Advanced Control Network (ACN) that is under way, and new TCP/IP-based network technology that already is available.

## Advanced Control Network

Industry standards leaders are working on the ESTA ACN, which should come to fruition in 2001. Using TCP/IP (the protocol of the Internet), ACN promises to give the lighting industry a common communication network that will allow equipment from multiple manufacturers to interact in many useful ways.

Interoperability among different types of equipment was pioneered with DMX512, the ubiquitous control protocol that has driven the lighting industry since 1986. In the past decade and a half, DMX512 has been the industry's only common protocol — so everyone gravitated toward it. Consequently, DMX512 has been shoehorned into a lot of applications for which the fit was questionable, resulting in systems that can be somewhat cumbersome to configure, use and maintain — especially when they contain hundreds of automated fixtures using thousands of DMX channels.

ACN will offer new possibilities. The intelligence of ACN will drive systems toward a plug-and-play model, where new equipment will announce itself to the network and allow the operator to configure it automatically. Imagine not having to climb a ladder to set address switches on a moving light. We can't wait!

## TCP/IP network technology

Until the promise of ACN arrives, the world of lighting networks is enjoying other advances. The biggest change in the last few years involves the way that we ship data around a performance facility or a television studio.

Not too long ago, most designers and consultants had to install two cable plans in a facility — one Category 5 for Ethernet and one shielded twisted pair for DMX. The Ethernet handled the console-specific functions, while the DMX cable plan routed data to dimmers, scrollers, moving lights and other DMX accessories.

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Often, the DMX cable plan was fed by large banks of opto-isolated splitters or by a crosspoint router such as the Gray Interfaces Pathfinder. The cost of the cable plan could be significant, since each DMX cable was a “home run” from its outlet to the console location. Now, with new TCP/IP-based network technology — such as Strand's Shownet and ETC's ETCNet 2 — the separate DMX cable plan is fast becoming a relic of the past.

We now can wire a facility with a Category 5 network, “inject” DMX onto the network from any node location and “extract” DMX from the network at any node location. The

*continued on page 8*

result: a huge reduction in the amount of permanently installed wire in a facility, with a virtual DMX crosspoint router that comes at no charge with the network management software. And the virtual router is smart — it allows you to specify arbitrary DMX address boundaries on nodes. That stops you from wasting DMX channels on the network because you can tailor precisely the number of DMX channels coming onto or off of the network at every node location.

### Making networks more accessible

One of the few disadvantages to this approach is the fact that current network nodes still have a relatively high cost — in the \$1,000 range. This cost forces designers to scrimp on nodes. As a result, they use additional portable DMX cabling to get from the limited number of nodes to the final locations of scrollers, moving lights and other equipment. But at least one manufacturer is working on a low-cost “wall plate node,” which will fit in a 4-inch by 4-inch backbox and get two universes of DMX in or out of the network. Couple that with the new “power over Ethernet” standard that is being worked on by the big boys of the computer industry (the IEE

802.3 Committee, which includes engineers from Cisco Systems, 3Com, Nortel and other manufacturers of LANs, WANs and Internet hardware), and we have a self-powered network node that looks like a duplex outlet cover plate.

### New options for today and the future

Another advantage of the new TCP/IP lighting networks is their ability to use inexpensive mainstream office network products. Switches, routers, network printers and data servers are all tools available to lighting systems designers. You haven't lived until you've backed up a show on your lighting server, printed it on your network printer, and then downloaded it onto a console in another theatre over the Internet. That's happening today — even before ACN hits the streets.

Of course, as the cost of an Ethernet node continues to fall, one can imagine that devices like dimmers, scrollers and moving lights eventually will plug right in to the network, turning DMX512 into a legacy protocol used only in very small, simple systems. That architecture will unlock the true power of ACN and greatly increase the user friendliness of lighting systems.

## IN FOCUS

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