

# BIRKET ENGINEERING NEWS

Control Solutions for  
Themed Entertainment  
Spring 2000

## EPCOT® SKYSHOW HIGHLIGHTS WALT DISNEY WORLD® MILLENNIUM CELEBRATION

### New Nighttime Spectacular Under Control

**B**IRKET Engineering has completed work on Epcot's® newest nighttime spectacle, "IllumiNations 2000: Reflections of Earth". The nightly show is the largest of its kind in the world, culminating a full day of entertainment that has been created for the year long Walt Disney World® Millennium Celebration.

Under the direction of Walt Disney Imagineering's Kirk Winteroth and Jerold Kaplan, the team designed, built, and installed the system to meet the show's October 1999 opening. During the critical period of rehearsals, the team provided round-the-clock support for the after-midnight "IllumiNations 2000: Reflections of Earth" rehearsals while maintaining support for the daily maintenance and running of the original show. The schedule demanded that the new control system be phased into service as equipment was renovated or delivered. This put the system's architecture to the test as it incrementally replicated the old show's functions one-by-one while remaining ready to rehearse the new show at

*(See Spectacular, continued on page 2)*

### "Illuminations 2000: Reflections of Earth"

#### BIRKET Engineering Team

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**Dan Birket**, control system concept

**Steve Eckwielen**, lead software engineer

**John Torrey**, software engineer

**Janet Skladany**, software engineer

**Tom King**, lead hardware engineer

**Deb Waterhouse**, hardware engineer

**Kevin Kakascik**, design

**Juno Barwikowski**, design

**Frank Mifkovic**, production

**Gail Napier**, production

**Mike Ryan**, production

**Marie Ryan**, production

**Heather Sozio**, project coordination

**Jackie Birket**, purchasing

**Brian Kuhar**, engineering intern

### "IllumiNations 2000: Reflections of Earth" is Nightly Epcot® Finale

**D**ancing flames, cascading fountains and eye-popping fireworks synchronized to a dramatic musical score light the skies and decorate the lagoon of Epcot's® World Showcase during the all-new "IllumiNations 2000: Reflections of Earth".

The nightly spectacle, created by Show Director Don Dorsey, is the grand finale of each day's 15-month Walt Disney World® Millennium Celebration which began last October and continues through January 1, 2001.

"IllumiNations 2000: Reflections of Earth" begins with a cosmic event that leads to a ballet of fire and "chaos" signifying the origins of the planet. That mayhem transforms into a sea of floating pyrotechnic stars on World Showcase Lagoon, setting the stage for the appearance of the show's centerpiece, Earth Globe.

The dramatically spinning Earth Globe, a 28-foot diameter sphere, becomes a three-story video screen projecting vivid pictorial images that celebrate both human diversity and the unified spirit of mankind.

Covered with video screens in the shape of the continents, the twinkling, steel ribbed Earth Globe rotates on a 350-ton floating island that houses six computer processors, 258 strobe lights and an infrared guidance system.

Using more than 180,000 Light Emitting Diodes, the electronic pictures depict primal seas and forest and the development of famous cultural landmarks including the Himalayas, the Sphinx, the Easter Island statues and Mount Rushmore. Diverse visages of famous people from around the world such as Martin Luther King, Dr. Jonas Salk, Mother Teresa, Albert Einstein, Mohammad Ali, and the Dalai Lama are captured on the Earth Globe sphere during the presentation.

A dazzling visual mix of leaping fountains of water, fire and fireworks is choreographed to a

*(See IllumiNations, continued on page 2)*

### "IllumiNations 2000: Reflections of Earth" Fast Facts

- A 13-minute nighttime spectacular on and above World Showcase Lagoon.
- Earth Globe is the world's first spherical video display system, wrapped in 15,000 LEDs.
- Shells come from China, Italy, U.S.A., Japan.
- Shell types: comets, candles, mines, shells, tailed shells, crossettes, scattering bees, whistles, reports/salutes, ground effects, floaters.
- Four fountain barges each pumping 5,000 gallons of water per minute.
- A 150,000-pound inferno barge uses 37 nozzles to shoot propane flames skyward.
- A full color spectrum of lasers, including four custom Disney colors (lagoon blue, mint green, pumpkin orange, and lavender).
- Walls of flames and a giant torch climb 40 feet above world showcase lagoon.

Every control system must be evaluated and designed with consideration for the details of the specific application. Information in this newsletter is not meant to be an engineering or legal opinion.

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*(Spectacular, continued from page 1)*

11:00 each night after the park closed.

BIRKET Engineering's involvement with Epcot's<sup>®</sup> Millennium project began when Dan Birket presented a concept for a robust and extensible global show control system using off-the-shelf components and familiar technologies to meet Walt Disney Imagineering's tough requirements and the short, inflexible schedule of the impending millennium year.

The show control system manages and cues show equipment spread over more than 70 acres in and around the Epcot<sup>®</sup> lagoon, including all pyrotechnics, six lagoon barges, eleven nation pavilions, nineteen flame towers, lasers, and eight syncro spot lights. The four renovated and two new lagoon barges include all-new controls for pyrotechnics, water, flame, and mechanical effects, including the centerpiece flower-petal earth globe.

Special function control systems (including the earth globe's video system and the fire barge's flame control) by others were integrated into the global show system. Other sub-system controls (including the flame tower controls and the core of the audio system) were delivered by Birket Engineering together with the global control system.

Several robust data networks were used to connect the components of this far-flung installation, including wired and wireless SMPTE time code signals, active safety-enable signals, shore-side programming ports, and a lighting control network three times larger than usually employed. Critical signals are carried by redundant routes, permitting the show to go on despite a cable loss. The existing cable plant was updated to carry modern data protocols where possible, and a new wireless Ethernet provides extensive monitoring capability and compatibility with next-generation show equipment.

The system architecture permits easy development of new shows and live control of most elements from a familiar lighting board user interface. The extensible architecture encourages the addition of future elements and made it easy to add elements during rehearsal as the show's creative concept matured.

Delivered equipment included six barge show control cabinets, six fireworks control cabinets, one lighting control cabinet, three show and audio control cabinets for use in the technical director's booth, and numerous enclosures to interface with the lagoon torches, sea wall mortars, nation pavilions, syncro lights, fountain and fire barges, and fireworks launcher.

The system includes ten Alcorn-McBride Light Cue DMX playback devices, seven Anitech Media Pro 4000 show controllers for the analog functions, seven Allen-Bradley SLCs for safety systems, effect control, and equipment monitoring, and six Pyro Digital controllers.

Article Courtesy Epcot Brand Management

*(IllumiNations, continued from page 1)*

symphonic score crafted by British television and Hollywood motion-picture composer Gavin Greenaway. This powerful composition blends the melodies and rhythms of many regional cultures with an uplifting, unifying theme.

The inspiring performance concludes with the Earth Globe opening up like a lotus flower. From its heart emerges a giant fire torch rising 40 feet into the air. Nineteen additional torches ringing the lagoon combine with a confetti of fireworks creating color-rich reflections across rippling waters.

"My goal was to remind people that our home planet is an amazing place, especially during one of the most unique celebrations in history," said Dorsey. "This show weaves the story of our planet, using mystical elements that signify unity and peace for all humankind."

The 13-minute show requires 67 computers in 40 locations, hundreds of special lighting fixtures, four fountain barges pumping 5,000 gallons per minute, a 150,000-pound inferno barge with 37 nozzles shooting propane flames into the air, and lasers delivering a kaleidoscope of colors.

Some 2,800 shells are exploded during the nightly display -- more than twice the number used in previous productions. Fireworks are launched from 750 mortar tubes and 56 firing modules at 34 locations.

"The dawn of the third millennium is an appropriate time to look back on our origins, heritage and accomplishments, and to contemplate the course of the future we will build together," said Dorsey. "'Reflections of Earth,' like Epcot itself, is a celebration of our home planet, our humanity and our potential."

Article Courtesy Epcot Brand Management