

Soarin': The Making of a Free-Flight Fantasy

Inside the Technology

LAKE BUENA VISTA, Fla. — Walt Disney World Resort takes Epcot guests on a high-flying magical journey that sweeps them up, over and across the richly diverse landscape of California. Never before Soarin' has anyone had the opportunity to view the Golden State from a bird's-eye view with such an extraordinary sensation of free flight.

Using stunning cinematic artistry and Walt Disney Imagineering-developed motion-based technology, Soarin' literally lifts 87 guests at a time 40 feet aloft into a giant projection screen dome. From all sides — up, down, left and right — their field of vision is completely filled with the beauty and wonder of California as their flying theater takes them soaring on an unforgettable journey.

So how does it all happen? How can technology be so “invisible” to the experience?

“The genesis of the idea goes back to our dream of being able to fly, along with the impressive natural beauty of California,” said Kathy Mangum, Walt Disney Imagineering executive producer/vice president. “There’s the ocean, Big Sur, the mountains and desert — an unbelievable variety of terrain and spectacular topography. Clearly we wanted to use film to capture the beauty of all that, but how do you do it in a way that’s never been done before?”

The Flight

The challenge was a formidable one. “One of the early designs was a series of little hang gliders on a conveyer belt system, but it had all kinds of problems,” explained Mangum. Several other concepts also fell by the wayside.

It wasn't until Mark Sumner, a Walt Disney Imagineering show/ride engineer, decided to take the problem home over the weekend that the challenge was resolved.

“I think I'm like a lot of Imagineers where I don't necessarily leave my job at the office,” said Sumner, whose specialty is creating ride systems. One particular weekend, he started sketching some concepts for the Soarin' ride design and was trying to figure out how to best convey his ideas to his team.

“I remembered I had a 40-year-old toy, an erector set that I got when I was a kid,” said Sumner. “So I pulled it out of the attic, and over a couple of hours, I built a working model.

When I came back to the office on Monday, I set it on the table, cranked it up and said, ‘Maybe we can do it like this.’ As they say, the rest is history.”

That kicked off a tremendous engineering effort, and a considerable amount of research and development followed to achieve the remarkable technological result of what literally started with a child's toy.

Sumner's concept — small enough to hold in his hands — grew into a ride structure containing one million pounds of steel that is able to lift 37 tons.

The Film

The counterpart to the engineering complexity of the attraction was the cinematic challenge of generating film that would immerse guests in the visual aspect of the ride. “We filmed everything from a helicopter,” explained Rick Rothschild, Walt Disney Imagineering senior vice president and the film's director. “We used an IMAX camera with a special lens that captures everything within a person's visual periphery.”

Shooting in a variety of locations around the state was not always an easy task, particularly in a place like Yosemite

National Park where governmental restrictions usually prohibit flying inside the park's valley.

"We were fortunate to be able to make an agreement with the Department of the Interior to acquire a four-hour window on a specific date to get our shots," said Rothschild. "That meant no changes to the schedule no matter what kind of weather we had on that day. As it turned out, it was one of those clear and pristine blue-sky California days, and we got incredible footage of the valley, Bridalveil Fall and Half-Dome."

Each location in the film brings to life the beauty and diversity of California, whether it's soaring over the mountaintops of Lake Tahoe or gliding across the sands of Anza-Borrego Desert State Park. "And don't forget that your other senses are involved as well," said Rothschild. "You're totally immersed. You feel, hear and smell things at the same time that you're enjoying all the visual wonders as you fly within the film that surrounds you."

To further enhance the experience, the film is projected at 48 frames per second, twice the speed of normal motion picture film, resulting in a crisp, clear image with extraordinary definition.

"I like to think that in Imagineering we practice the art of 'invisible engineering'," said Sumner. "If people are thinking about the big machinery and how we're moving them around, then we haven't done our job. I think that Soarin' takes most people by surprise because it really does give you that feeling of flight. The smells, the sound and the video — put them all together in a symphony and time them just right and it all comes together to create an experience that people truly enjoy."