

# Mission: SPACE . . . Launching an Adventure Through Technology

*Imagineers Weave New Story Magic to Create First-of-Its-Kind Attraction*

LAKE BUENA VISTA, Fla. — Creating a first-of-its kind attraction that would combine unique aerospace technology with classic Disney storytelling presented a world of technical challenges to Walt Disney Imagineering, the creative development and design arm of the Disney theme parks. Specifically, how would Imagineers use technology to create a realistic experience of rocketing to Mars? The answers are found in technical know-how and innovation, research and consultation with space professionals, and a dramatic storyline inviting guests to explore a new world.

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## **NASA Astronaut Training Provided the Starting Point**

The goal of Imagineering was to make this landmark attraction as realistic as possible — complete with the emotional, mental and physical challenges astronauts face in space. To accomplish this, the Mission: SPACE team spent years consulting with present and former NASA advisors, astronauts and scientists from California Institute of Technology's Jet Propulsion Laboratory (JPL). They personally experienced astronaut and pilot training simulators at facilities throughout the United States. The in-depth research enabled development of a training process that combines elements of what astronauts undergo:

- Understanding and learning to use the spacecraft
- Familiarization with specific roles and expectations
- A team training experience
- Shuttle simulator of launch, approach and landing
- Visual simulations of space
- Computer-generated sound simulations of the craft and Mission Control

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## **First-of-Its-Kind Ride System Required for Launch**

Development of the ride system called for an entirely new approach. This first-of-its-kind custom-designed ride system is based on NASA's astronaut training techniques and sophisticated computer software and hardware systems.

Mission: SPACE is built on existing principles of centrifuge technology to generate the true-to-life sensation of launching vertically. The integration of pitch and roll movement adds incredible realism to the experience.

The g-forces guests experience are of less force and less duration than an actual shuttle launch and are actually lower than many roller coasters, but special effects and visuals add to the sensation to create an incredibly realistic experience of space travel.

The 10-arm ride system can accommodate 160 guests simultaneously, making the capacity of Mission: SPACE comparable to all major Epcot attractions.

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### **Creating the Planet Mars**

The visual telling of the story involves its own technical marvels. The challenge of creating a believable “view out the window” resulted in Imagineers’ development of a unique virtual imaging system. The systems were built to the highest optical quality standards used in industrial or military applications, including a state-of-the-art video flat screen using components not yet available in the marketplace. A combination of LCD glass and electronic video cards were specially designed to enable ultra-crisp full motion video. All guests — no matter how tall or short — will see a spectacular space-scape: the system is designed to ensure stellar viewing is available to guests of all heights.

The planets Earth and Mars that guests view out the capsule window are more than realistic artists’ representations — they’re computer-generated from data provided by satellites and spacecraft orbiting the planets, including Mars Odyssey and Global Surveyor. Thus the Mars that guests see includes real landforms created from scientific height data and photographic imagery.

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### **Spacecraft of the Future**

When guests first enter the attraction through the “Sim Lab,” they see an oversized graphic of the X-2 spacecraft with detail explaining the deep-space shuttle’s functionality. The X-2 is the creation of Imagineers, but it is based on scientific fact and theory as provided by associates at NASA and other advisors. Imagineers worked with scientists specializing in the future of space travel to develop a concept of a next-generation spacecraft. Such a rocket would be made from “Buckeytubes,” a lightweight material discovered in the 1990s that is 100 times stronger than steel. The X-2 craft would be powered by an aerospike engine using hydrogen and oxygen.

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### **Accommodating Guests, Gear and Technology**

The typical entry into a NASA or pilot flight trainer is by ladder and requires extensive instruction and/or training. The Mission: SPACE four-person flight capsules were designed for easy entry and exit, with doors, restraints, seating, stowage and guest controls developed for easy operation. Coupled with the pre-show experience, this allows many people to experience the ride with minimal instruction.

The technological complexity of the ride system required an enormous amount of equipment, computers and technology to be carried on board. Through the use of engineering and manufacturing techniques from a wide spectrum, Imagineers combined ultra lightweight carbon fiber materials with airplane wing construction techniques and integration of components into the capsule itself. For example, the thunderous sounds of the launch come from a stereo woofer built right into the back of the capsules.

Design specifications included the requirement that all of the electronics had to be able to withstand multiple

“launches” every day, and multiple endurance tests were conducted before the units were released for production. Multiple computers on board the ride ensure synchronization of the video, audio and motion of the capsule to create a realistic and powerful experience.

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### **Groundbreaking Experience**

The experience of Mission: SPACE embodies the hallmark of Walt Disney Imagineering: a seamless blend of storytelling, engineering, imagination and technology. Mission: SPACE may reach for the stars, but the design, engineering and construction of the attraction were firmly grounded. More than 650 Imagineers logged 350,000 hours in bringing the attraction from concept to reality. They worked with 25 space experts, including five astronauts, from NASA and the Jet Propulsion Laboratory.

The groundbreaking experience and technology of Mission: SPACE is the newest step forward in Disney Parks and Resorts' tradition of delighting guests in ways that have never been done before. Only at Mission: SPACE can guests enjoy the thrill of an “astronaut-like” adventure from pulse-racing liftoff to the incredibly realistic sensation of traveling through space.

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For more information, contact Walt Disney Imagineering:

Ralph Kline – 407/560-2523

Marilyn Waters – 818/544-2142

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