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Face-to-face with Atlantis

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KENNEDY SPACE CENTER

Inside: AV Europe



One for the kids: pathways replicate the shuttle slowing down during descent



Atlantis from above showing open bay, arm and a UK editor with VIPs

Atlantis rises again

KENNEDY SPACE CENTER



Welcome to the show

Clive Couldwell was the first UK journalist to gain access to Kennedy Space Center's megabucks space shuttle exhibit before it opened to the public on 29 June after a three-year build.

It's difficult not to be impressed when you're standing underneath one of the most recognisable symbols of space exploration. Atlantis took part in 33 missions and still bears the scars, scorch marks and space dust from its last adventure.

The \$1.7bn, NASA-owned space shuttle and star of a new \$100 million, 90,000 sq ft attraction is facing a different future. Just two years after its final mission and following memorable scenes piggybacking a 747 across the US, Atlantis is now back at Kennedy Space Center, space flight's home and where all 135 space shuttle missions from 1981 to 2011 were launched and processed.

Now with a completely refurbished entrance area thanks to Electrosonic and Whiting-Turner



System functionality in the AV room



Engine education: an in-depth look at the shuttle's power systems



View from behind showing vast underside and heat tiles

Construction, Kennedy's Visitor Complex is now placing the public nose-to-nose with Atlantis. Sixty interactive experiences also highlight the colour of NASA's ground-breaking exploration and development programme that was also responsible for the Hubble Space Telescope and built the International Space Station (ISS).

Tilted on its side at a 43.21-degree angle, the shuttle looks as though it's floating in space with payload bay doors open and robotic arm extended - a view previously only seen by astronauts. Made from 2.5m hand-made parts Atlantis equally represents a milestone in the exploration of space and a stepping stone into whatever's coming next.

Visitors conduct a virtual EVA (or extravehicular activity); practice docking to the ISS; extract cargo from the payload bay; create sonic booms and glide to a landing on the Re-entry Slide; experience the sensation of floating in space; explore a high-fidelity replica of the ISS; virtually mate Atlantis to the external tank; kick up a virtual chemical reaction to launch the shuttle; get an X-ray view of Atlantis' interior; experience an orbital sunrise; strap in to the sights, sounds and sensations of a shuttle launch; and take the helm at the shuttle cockpit.

As *AV Magazine's* site guide, Tim Macy - director of project development and construction, Delaware North Companies Parks and Resorts - the concessionaire which operates all the attractions within the Kennedy Space Center Visitor Complex

- boasts proudly: "We call her our girl. She has her own personality which keeps changing as the lights change. It's a theatrical environment (there are 1,750 theatrical lighting fixtures in the Atlantis building). Her mission now is to inspire a new generation. Pay deference to the past but also the future. Entertain, but also educate."

However, the logistics behind getting such a monster of an artefact like the Atlantis into the exhibition building was a project in itself. For example, its 60ft long, payload doors were designed to be operated in space, rather than one-g (gravity). "Down on earth, it's a different kettle of fish. You're dealing with tons of metal," says Macy.

The shuttle's landing gear was eventually removed, and the orbiter jacked up a couple of inches at a time using four sets of 180 ton jacks which slowly tilted her just over 40 degrees after she'd reached 30ft. Removing the landing gear lost another 20,000 lbs of weight and the project team was able to drain off around 85 gallons of hydraulic fluid, a process which should also help to preserve the shuttle.

The project

The story of the Atlantis project dates back to 2010, when Delaware North and PGAV in partnership with NASA gave designer PGAV Destinations a simple brief: to design and create the world's premiere space exploration attraction. PGAV in turn

engaged Electrosonic in a four-phase design and consulting process. PGAV Destinations' project architect for the attraction, Emily Howard recalls: "From the outset we wanted to combine the architecture of Atlantis with technology in a way that had never been done before."

The Electrosonic consultant charged with overseeing the audio, video and control systems design was Yiannis Cabolis: "Finalising the technology topology and equipment selections for the Atlantis AVC (Audio Video and Control) design required many steps, including technology briefings, 3D projection studies, evaluations, demonstrations and mock-ups," he says. "At quite an early stage, we decided we would put the entire AVC technology system on a data network. This not only provided the functionality we needed, but also simplified interfacing to the building's architectural and theatrical lighting, building management system, and fire and safety systems."

Walking through

The first thing that greets visitors to the space shuttle exhibit outside is the external tank and solid rocket boosters (ET/SRB) assembly which towers 15 stories above the attraction. The ET/SRB debuted in 1981 and could generate seven million pounds of thrust at lift-off, providing the power needed to launch Atlantis through the sky and out into space. »



Atlantis alongside a replica of the Hubble Space Telescope (and right)



Alongside the ET/SRB is the building that houses the Atlantis attraction itself. Designed by PGAV Destinations to feature two 'wings' representing the space shuttle's launch and return, the exterior also features an internal wing covered in a shimmering tile pattern, reminiscent of the tiled underside of the shuttle. Conceived from the start with responsible energy usage in mind, the building is designed to meet LEED Silver sustainability standards.

As is now commonplace at big attractions, on entering the building visitors are treated to a multimedia pre-show that provides the historical context for the exhibits they are about to see. Content was created by the California-based expert in large format media design for shows and attractions, Mousetrappe. The company created a combination of live-action re-enactments, original historical footage, and computer-generated animation. The main show played in an immersive architectural environment that surrounds the audience, transporting guests to the centre of the action.

All this is played out on an 110x20 ft, 8mm LED wall which acts as a backdrop to the orbiter. During the pre-show presentation it displays the earth as the Atlantis is revealed. The display is bolted on to a sub frame provided by Electrosonic and anchored from the back to the adjacent wall.

The Atlantis pre-show also features some four projectiondesign F35 wqxa video projectors, edge-blended to form an immersive experience, with content being served by individual, multi-head, custom-configured Delta media servers from 7thSense Design.

Sixteen projectiondesign F32 projectors, running in 1920 x 1200 resolution and edge-blended in groups of four, are used to add video content for the four 'arches' that surround the shuttle itself. The show is synchronised using Medialon show control, with sound coming from a predominantly QSC multi-channel audio system and additional audio effects courtesy of TiMax. Florida-based consulting firm Siebein Associates Inc was responsible for the specialised acoustical treatments used here and elsewhere in the attraction.

Much of the technology used has proven benefits for designers of visitor attractions, as Cabolis explains: "The 7thSense Design Delta media servers are typically found in digital planetariums or as media play-out devices in high-demand, multimedia interactives of the kind that you often get in visitor attractions. They are physically locked to each other so that independent timelines can be triggered with frame accuracy. This is very important when you have so many display sources to synchronise with one another."

QSC's Q-Sys networked audio delivery technology is being run over an IP WAN: "Q-Sys monitors all the QSC amplifiers via data port connectivity, giving us remote standby control, device status information, and DSP – all essential when you have an AVC installation of this size," adds Cabolis.

Like the pre-show area, the main exhibit space, together with the life-sized, high-fidelity model of the Hubble Telescope and the plethora of interactive installations that honour the achievements of



Simulators for docking and...



...landing the shuttle

NASA's space programme, all use Medialon show control interfaces, run over IP to provide systems supervision and maintenance as well as media delivery, in conjunction with the Q-Sys network.

"We even have IP camera-based people counters that will assist the Delaware North operations team with throughput management," adds Cabolis. "There are live feeds as well as pre-recorded shows at this installation. And since the video and audio are not always embedded, they require synchronisation on the fly."

In detail

The Hubble Close-up Movie Wall highlights the famed space telescope whose images are displayed via two projectiondesign F35 video projectors; eight speakers supply audio. A life-sized model of the telescope is also on view.

The International Space Station Micro Gravity Theater presents a realistic view of astronauts aboard the ISS. It features a large TransScreen – a translucent membrane that acts as the projection surface for a pair of 10,000-lumen projectors installed behind, and at an angle to, the transparent material. Audio is fed to eight speakers, and a 26in touchscreen so visitors can interact with it.

In fact, interactive stations populate the entire Atlantis attraction. Three of the most interesting directly relate to the orbiter. The Crew Module AR consists of three multi-axis movable pods which Electrosonic has outfitted with 26in touchscreens, small USB-powered line array speakers and webcams. Electrosonic also supplied four rotary encoders for each pod which feed position information in USB form to a PC.

The Aft Fuselage AR is similar to the Crew Module with its three multi-axis movable pods and equipment. The Cockpit 360 interactive offers an encompassing view from the driver's seat and features a 26in touchscreen with USB-powered line array speaker and four rotary encoders.

The STS Timeline presents visitors with six 55in LCD multi-touch displays installed in portrait mode at a slight angle to the horizontal in a table configuration. They are fed by a PC and have dedicated line array speakers powered by local amps.

The International Space Station Media Wall is another bold display featuring seven 55in LCD multi-touch displays in vertical portrait mode. They are also fed by a PC and have customised low-profile speakers and amps.

Electrosonic designed the EVA, or space walk, interactive with three identical systems, each operating independently. A 65in LCD screen is installed at each exhibit along with a 3D depth-sensing system that allows the visitor's actions to trigger the media application. A source PC, located at the exhibit, received data from the sensing system and triggers the media app. Audio is fed from the local PC to a passive micro line array speaker.

A series of simulators involve visitors even further in the space shuttle's routines. Landing the Orbiter simulators comprise nine kiosks fitted with 26in displays, each connected to their own PC and small USB-powered speaker. Robotic Arm and Docking Station simulators consist of twelve separate kiosks each with four 19in displays; they are connected to their own PC and small USB-powered speaker. Electrosonic provided interfaces for one joystick and up to eight buttons for each of the simulator kiosks.

Finally, the Beanie Cap Floor Interactive, named after the beanie caps that covered the tops of the space shuttles on the launch pad, features an SXGA+ resolution projector which Electrosonic custom-mounted to throw the image through a 45-degree mirror down to the floor. A sensing device connects to a server in the EER; four speakers deliver two channels of audio. ■

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www.kennedyspacecenter.com
www.delawarenorth.com
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