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June 2013

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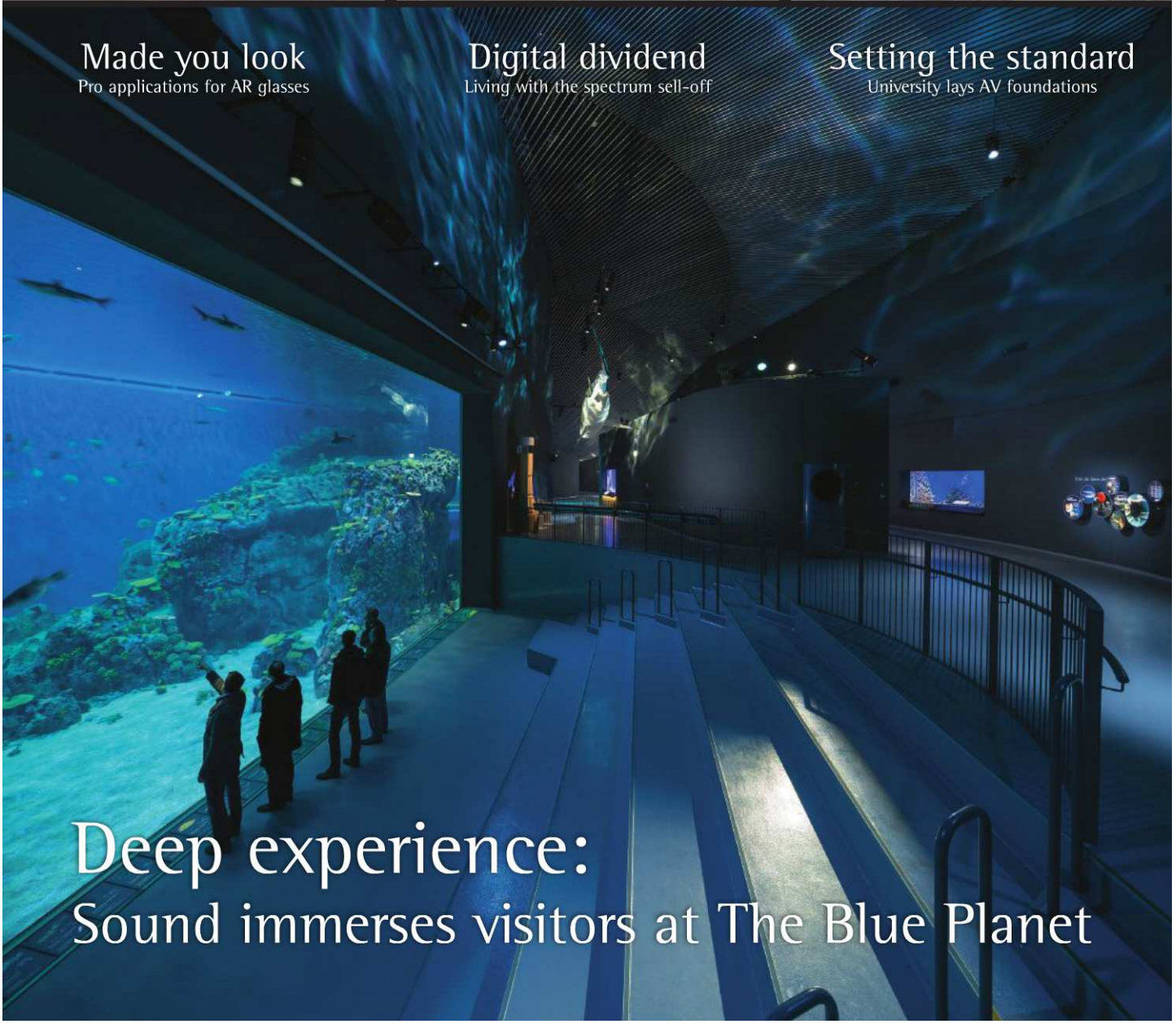
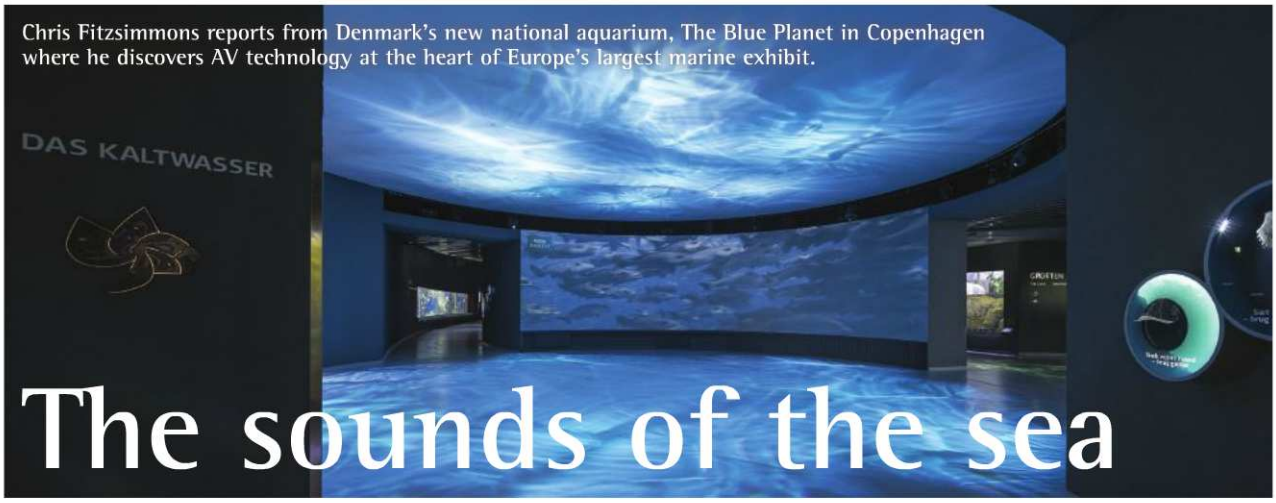


Deep experience:
Sound immerses visitors at The Blue Planet

Chris Fitzsimmons reports from Denmark's new national aquarium, The Blue Planet in Copenhagen where he discovers AV technology at the heart of Europe's largest marine exhibit.



The sounds of the sea

Den Blå Planet is a striking new visitor attraction built by the sea just south of Copenhagen, set to be one of the city's key visitor attractions for its intended life of 30 years. It features 20,000 specimens from 450 species of marine life including fish, birds, sea lions and a wide variety of flora and fauna. Its total of 53 separate tanks hold some 7 million litres of water and its largest tank, the Ocean Tank, holds 4.1 million litres alone.

Built in the form of a giant whirlpool the entire exhibit is designed to create the impression of being immersed beneath the waves, as Mads Havemann of exhibition design agency Kvorning Design explained:

"When you enter the foyer, you are greeted by a beautiful BBC film, and by shimmering lighting effects that give the feeling of being under water. We co-operated with [AV consultancy] Stouenborg from day one on the concept of sound and lighting. Everything is designed to push towards that feeling of being in the water.

"We were given the assignment of making sure that the building tells the stories that the national aquarium wanted to convey, and to make sure that its form, and format give a feeling that is natural. It has the colour of water, the feel, the motion and the sounds of the sea.

"We've really tried to combine the fish and the technology here. Some of the interactive exhibits even allow you to interact directly with the fish. For instance there's an aquarium that simulates a river habitat. There you can actually change the direction of the current and see how the fish react to different current patterns."

Anders Jorgensen, a partner in AV design and consultancy firm Stouenborg was involved almost as early in the project, when his company was invited by the architect 3XN to help them tender for the aquarium.

"Over just a weekend we were asked to come up with some concepts, and we came up with this idea to involve sound, without the traditional tour guide system. We wanted to create this family group experience where you wouldn't get shut off by a pair of headphones.

"The general idea was to create two separate tracks for sound. One that would fulfil the vision of the Blue Planet for a general PA system for every part of the building, and one that became a mood system for atmospheric sound."

The complex atmospheric sound solution contains a total of 600 specially recorded audio tracks, created in the studio by Stouenborg, which are played back through a total of 11 different zones. They were layered and mixed on top of each other across the different speaker zones. This creates a homogeneous soundscape that envelops the visitor in bubbles, splashes, gurgles and subtle string and synth effects, which accompany him on a journey through five different marine environments.

> *"When you enter the foyer, you are greeted by a beautiful BBC film, and by shimmering lighting effects that give the feeling of being under water."*
> *- Mads Havemann, Kvorning Design*

This complex audio mix is enabled using Meyer Sound's D-Mitri digital audio processing and distribution solution, and reproduced via a large selection of Meyer Sound loudspeakers from small MM4XPs up to UPJ cabinets and UPS sub woofers.

D-Mitri meant that Jorgensen could distribute any of his tracks to any of the speakers at different levels and times. "The matrix allows us to send anything, anywhere and fulfils the vision of being able to move wind and waves around the building. On the other hand we can turn the whole place

Tech-Spec

Audio

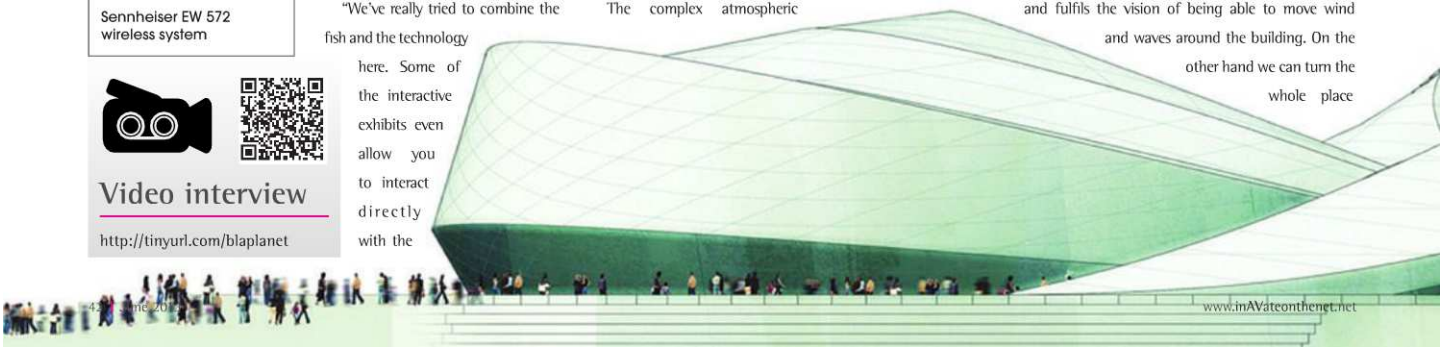
Meyer Sound D-Mitri DCIO, DCP-1, DWTRX-W1 units, MPS488HPS power supplies, MM-4XP, UP-4XP, UPJ-1P, MM-10XP, USW-1P, MPS-488 loudspeakers

Monacor LC 31 antenna combiners

Sennheiser EW 572 wireless system

Video interview

http://tinyurl.com/blaplanet



The shape of this glass tunnel was adjusted in the design stage to provide better acoustic performance.

in a discotheque for a special event, playing the DJ track through some really great sounding speakers at high SPL!

"Even considering that, we've used Meyer's low-voltage series all over so we don't use much power. Compared to similar spaces I think we're drawing about half as much current as we would have expected to. I think that's quite amazing."

Because of the length of the process (starting back in 2009), the system was designed and built around a Cobranet network, although Jorgensen admitted that if he's known about it at the time he would have designed it using AVB.

D-Mitri is doing much more than simply pushing sound around though. It is acting as the heart of the media control solution. It's controlling the Sennheiser wireless microphones, sending SMPTE triggers to the Coolux Pandora's Box media servers and interfacing with the Grand MA 2 lighting desk, which controls the The Blue Planet's complex lighting system, via MIDI signals.

A Crestron RS-232 system was also devised to provide master start-up and shutdown of the various AV devices on the network. These include the array of Sanyo Projectors, the D-Mitri master unit, and it also controls media source selection in the presentation space, and main auditorium.

The auditorium is built into the main exhibit, and includes tiered seating arranged to view the giant 12x8 metre glass window that forms one wall of the Ocean Tank.

From this rather awesome backdrop, presenters and experts can discuss the fish in the tank, commentating using a Sennheiser wireless microphone solution, and divers inside the tank can also present to the audience outside.

Alternatively a giant motorised projection surface can be lowered to cover the entire tank, and this can then be used to show content from a pair of edge blended Sanyo projectors. This content is delivered from Coolux media servers as DVI signals extended over Cat6 using Black Box AV ACS4001a transmitter and receiver pairs. VGA signals from PC sources can also be displayed via the Coolux boxes, and these are extended from the original source using Extron XTP VGA extenders, also over Cat6 cable.

The projection of the BBC content in the foyer area is also delivered using Sanyo projectors. This content is 4k resolution material specially edited from footage provided by the BBC from its Blue Planet documentary series.

The star attraction from an AV point of view at The Blue Planet really is the sound system. Invisible when it needs to be and impressive when you notice it, a walk around the aquarium really does feel like a continuous experience instead of a collection of un-connected exhibits consisting of fish in tanks, which has been my previous experience of aquarium visits.

By really going to town on the sound-scape design, Kvorning and Stouenborg have avoided the issue of sound from one area bleeding into another simply by mixing the tracks and managing deliberately the transition between them.

The Meyer Sound system is good, but only as good as the acoustic volume which is occupies. The work done by consultants Gade & Mortensen Akustik in treating the walls, floor and ceiling with special surfaces and in including a thick absorption layer in the walls means that the sound of 2000-3000 visitors is loud but not over-powering, and has delivered an excellent STi in the auditorium space of over 0.85. This is well over the target value of 0.65 that Stouenborg set itself.

Summarising, Anders Jorgensen commented: "This was a really complicated project with a lots of details to consider. Simply installing loudspeakers in an environment like this required them all to be weather proofed and IP-67 rated. Meyer Sound's READ was really helpful in this regard."

Mads Havemann added: "There are always compromises in such projects but in broad terms we have accomplished everything that we wanted. By that I mean both Kvorning and the Danish National Aquarium. Stouenborg has been a great partner and there's been a real dialogue about how we can realise the scenarios, rather than just a case of us saying we want this, that and the other."

A great part of the success of The Blue Planet AV projected can surely be attributed to the decision by 3XN to bring in Stouenborg before any decisions were made. Everything from structured cabling, to speaker mounting points were considered much earlier than most AV designers can dream of, leading to shorter cable runs, sensible rack positioning and excellent acoustics. A perfect example of this was the redesigning of a particular glass tunnel beneath the Ocean Tank. It's height and breadth were adjusted after acoustic modelling to ensure that sound reflections from floor installed speakers crossed the tunnel at the average ear height of a person. Such details will go utterly un-remarked upon by visitors, who left happy in their droves on the day of InAVate's visit. So long, and thanks for all the fish indeed.

Tech-Spec

Video

Black Box AV ACS4100A, AVU4001, IC400A signal extenders

Coolux Pandoras Box video media server

Crestron DIN AP2 controller, CNX-8 button panels

Extron MTP T 15HD VGA extender, P/2 Distribution amplifier

Sanyo XU106*, DHT100L**, DHT800L** projectors

*Now rebranded as Panasonic PT-VX500, **Now discontinued