

Festival of sound

With so many spectacular shopping malls in Dubai, it takes something special to separate one from the pack. In Festival City, loudspeaker manufacturer Ateis believes it has found a way, as **Barney Jameson** discovers

NOT SO MANY YEARS AGO,

Texans used to claim that in America's Lone Star State everything was bigger, from the cars that oil barons drove to the skyscrapers they built. At the beginning of the 21st century, however, that boast is more suited to Dubai, where every new construction project is seemingly valued not only on the basis of its usefulness, but on how far it exceeds the project that came before it. Nowhere else in the world at the moment could the world's tallest building be nearing completion, with its successor already having been announced. In the construction capital of the world, competition is everything.

The same holds true of the spectacular shopping malls that are to be found all over the UAE's most developed Emirate. Once a haven for shoppers and not much else, the concept of what a mall should be has undergone something of a revolution beneath the desert sky, transforming into a magnet for tourists, thrill-seekers and sightseers. As one enormous mall opens, another bigger, more incredible project is announced. In such an environment, it's difficult for established malls to keep up with their neighbours.

So how does a mall continue to impress when it has no ski slope, no shark-pool, no claim to being the biggest in town to encourage visitors? In the case of Festival City's Festival Centre, the answer lies in the details; specifically the audio details.

But first, let's make no mistake: Festival Centre is already spectacular. Squatting on the Dubai Creek waterfront of the Festival City development, the 2.9m-sq-ft mall boasts 600 outlets, and will present the yet-to-be-completed 'city within a city' with its beating heart. Opened in March 2007, the centre won the International Shopping Centre of the Year prize at the 2008 Global Retail and Leisure Awards, and just a brief visit makes it clear why; the answer lies in its water-features, its glass-and-steel architecture, and the mix of boutique shopping coupled with the super-retailer outlets such as Ikea and HyperPanda that have found a home in the Power Centre portion of the mall. Like everything else in Dubai, Festival Centre seems enormous compared to its competitors elsewhere in the world. But this is Dubai, and nowhere else in the world is quite like it.

Nevertheless, Festival Centre stands out from the other malls with which it competes at home, and the method lies with Ateis, a Swiss loudspeaker, voice-alarm and evacuation system specialist, whose innovative approach to the centre's audio requirements could soon find itself repeated in malls across the Emirates. Rather than meeting background music requirements with a combination of concealed ceiling and wall speakers, Ateis has introduced digital beam-steering line array technology into the shopping environment, and the results are as impressive as the building that surrounds them.

Steering audio

While digital beam steering itself is not new in the world of professional audio, the concept of fully software-controlled arrays being used in a fixed installation environment such as Festival Centre is unusual. Yet the trend within professional audio is moving in this direction. Manufacturers such as Ateis and Renkus-Heinz have pioneered the technology, and now loudspeaker brands such as Tannoy are exploring it in a more serious way than ever before, with their eyes trained firmly on the installation market. The future, it seems, is at least partially beam-shaped. All of which makes the work of Ateis ME in the Festival Centre more important, particularly when the extent to which DSP beam steering is being used becomes clear.

Boasting not a single ceiling speaker, the mall's Crescent Walk shopping parade nonetheless benefits from perfect audio coverage across its curving walkway, served only by 14 line arrays positioned discreetly along the outside edge of the corridor. Following the Crescent into Festival Square, meanwhile, reveals a huge open area rising up in glass, marble and metal. It is as bathed with reverberant properties as it is sunlight – a challenge for the visiting musicians who use the square as a performance area. Yet here Ateis has met the challenge of an acoustic space more akin to an airport ticketing hall than a live music venue, with a system comprised almost entirely of fixed DSP-controlled arrays. The system sounds remarkable, despite the materials surrounding it suggesting that it really shouldn't.

The reason is called the



Dubai Festival City's Festival Centre mall is an impressive sight in glass and steel

Messenger range; Ateis' series of fully digital side-lobe free arrays, which are based on a patented algorithmic technique. Delivering a consistent mid-high SPL over a distance of 100m, Messenger arrays have begun to find a niche in the market for serving background music and voice announcements into particularly reverberant locations.

In Crescent Walk the Messenger Arrays are on home ground, providing BGM and voice announcement content in a potentially difficult, but not impossible acoustic environment. Seven Messenger XL arrays have been installed around the walkway at eye level, measuring 3m in height and delivering horizontal dispersion of 145° plus controlled vertical dispersion between 5° and 45°. The XL array uses 24 70W class-D digital amplifiers and has a frequency response of 100 to 1.5kHz, with a maximum SPL of 93dB (with pink noise) at 40m. Additionally, a further seven slightly smaller Messenger L arrays have also been installed, standing 2.39m high and using 18 70W amplifiers each. A stroll through Crescent Walk with Ateis ME general manager Hussam Al Haddad, quickly reveals why the company is taking such pride in the installation – as visitors move through each array's coverage pattern, the audio remains even and constant, yet unaggressive.

But it is only upon entering Festival Square that Ateis ME's true challenge becomes clear, and



Ateis ME general manager Hussam Al Haddad is justifiably proud of his office's work in the mall

the appeal of the Messenger range for this application obvious. The area boasts 26m of glass-structure ceiling, with a glass facade at its far end measuring 40m wide and 65m high. Overlooking the facade are the tiered balconies of the square's first and second floors, while on the ground level, centred in the performance area, is an artificial pond that can be either wet or dry depending on the occasion. With all of these difficulties in place, the Square has an RT60 measurement (the time it takes for a reverberant sound to drop by 60dB) of 4.5 seconds.

According to Mr Al Haddad: 'With this difficult acoustic environment, the client requested a solution that could provide intelligibility for announcements and evacuation,



A hard to spot Ateis Messenger array in Festival Square



Ateis developed its bass array technology in part to solve the difficult acoustics in Festival Square

but also high-end sound for events. The Messenger speakers were chosen, but they provide a mid-high range, and we needed to deliver the low-frequency response required for live performance in this area.'

Thus a system of two halves was created, with single 6m Messenger 2XL arrays flown left and right at either side of the facade, offering a 50Hz to 15kHz response and a 93dB SPL at 80m, from a matrix of 48 channels of 70W amplifiers. These are augmented by eight Messenger L arrays to complete the mid-high system. The delivery of the desired low-end thump, however required Ateis ME to

reach a new level of creativity that could still employ the digital beam steering that was capable of solving the Square's acoustics. 'As a result of all this, Ateis ME was commissioned to develop a new technology based on the Messenger line arrays,' explains Mr Al Haddad. 'This is how the bass array came to be.'

For anyone who visited Plaza 2008, the Ateis bass array may already be familiar – not only was it exhibited at the London trade show, it also won rave reviews in the press following the event. It is a stand-out example of the new R&D effort being poured into



Ateis engineers had to work through the night to install the sound system, avoiding daytime shoppers



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INSTALLATION



Fourteen Messenger arrays have been installed into Crescent Walk

beam steering as a technology, and Mr Al Haddad describes it as 'the latest technical citation of Ateis International in the field of intelligent audio solutions, and by far the first of its kind worldwide. Its fits in perfectly with the Messenger range.'

Based on the same patented algorithm as the existing Messenger range, the Bass Array (also known as the Lambda Array) was developed at Ateis' international headquarters in Switzerland over the course of a year, under the supervision of project manager Albert van der Hout – described by Mr Al Haddad as: 'the brain behind the Bass Array'. Mr van der Hout's achievement is significant; an application using just eight boxes (14m) can achieve full directivity and side-lobe suppression for frequencies down to 35Hz and up to 400Hz.

The system uses the same Lobe Assembler software employed for controlling the Messenger range, letting users build and shape the coverage pattern of the array's lobe's to suit the venue, including dual and triple lobe output. According to Ateis, the bass cabinets used in a Bass Array can also be of any brand or size, with the Lobe Assembler application

adapting to suit. The technology is controlled from a 19-inch rack mount frame providing analogue and AES outputs.

The new system has proven itself the answer to ensuring that Festival Square sounds as good as it looks, with two Bass Arrays flown left and right at either side of the glass facade, each comprised of eight active cabinets. 'With the Bass Array, we are able to steer the low frequencies over a long distance and keep the signal deviation within 2dB over 100m,' explains Mr Al Haddad, somewhat proudly.

Discreet processing

A significant part of the appeal of the both the Messenger range and now the Bass Array is its ability to blend in with its surroundings. Within Festival Centre, each column is open to view, but visitors are unlikely to pay them much attention, no matter whether they visit Crescent Walk, where the eye-height arrays seem no more out of place than the tasteful decor into which they are integrated, or in Festival Square, where the much bigger flown system is at first hard to spot against the imposing steel and glass construction to which it is attached.

The same principle is applied to the background processing, where Ateis ME has completed the installation with a well-concealed input box to the side of the main performance area, leading into a secure digital network that runs the entire Festival Centre installation, not only covering Crescent Walk and Festival Square but also the Canal Walk and Marina Walk outdoor locations, into which more conventional ceiling and wall speakers have been installed. These include 1500 Ateis RCS6FTS Ceiling Speakers, 800 Sentyer6 wall-mounted speakers, 22 SM500 Sound Tube wall-mounted speakers, 110 RS600 wall-mounted Sound Tube speakers, and 400 MSH30TC horn speakers in the Centre's mammoth car parking area.

'The Entire DFC public address, voice evacuation and pro-audio system is operated over the Ateis

secure digital network LAP (Linked Audio Processor), enabling 48 audio channels over a 4km run of fire-rated fibre-optic cable,' enthuses Mr Al Haddad. 'The system connects 20 nodes of LAP units and integrates with the IDA – the heart of Ateis voice Evacuation – to cover more than 480 speaker circuit zones.'

Arguably more remarkable than the system itself, is the speed with which it was achieved. From commissioning to handover for soft launch, Ateis International's Michael Weckesser was confronted with just 45 days to achieve a difficult install, with all of the work having to be done at night so as not to conflict with the mall's daily opening hours. More impressive still is the fact that Festival Centre was the first project with which Ateis ME became directly involved, having previously always relied on its

distributor network. Nevertheless, Mr Weckesser worked alongside technical manager Haider Al Attar and systems engineer Yasser Al Ani to hit the tight deadline. In total, the completion of the project's first phase took only 70 days.

But all of this, from the hard work that went into developing the Festival Square system to the long nights spent installing it, will remain a lost secret to the thousands of shoppers who pour through Festival Centre now, and the millions who follow later as Dubai Festival City continues to grow around the mall. Not that it matters – in the none-more-competitive atmosphere of Dubai, all that really counts is the reaction those shoppers will have to an impressive audio system that is helping this mall to keep up with its neighbours.

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