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DRUM SOLO

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BANGKOK

SUBTERRANEAN
SEOUL THEATRE

NEXO P12
DESIGN

Singapore: MICA (P) 031/06/2019 PPS 1604/05/2013(022953)

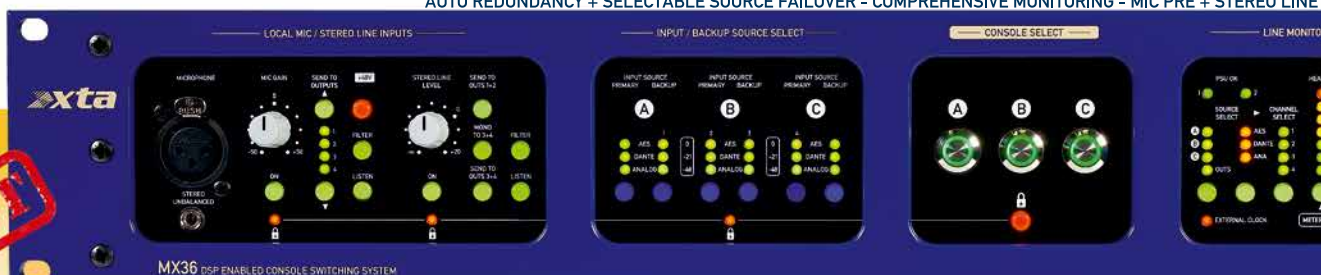
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Community spirit



Image courtesy of Marco Saroldi

When your local venue is due to host a major community celebration, you know you'd better get the acoustics right. **Caroline Moss** visits Auroville's revamped auditorium

AUROVILLE, AN EXPERIMENTAL COMMUNITY SET UP IN 1968 near Pondicherry in south India to allow people of all nations, creeds and politics to live together in unity, turned 50 in 2018. In preparation, local company Sound Wizard set to work revamping the Sri Aurobindo Auditorium to host the golden jubilee celebrations, which would be attended by Prime Minister Narendra Modi.

Auroville was conceived by Frenchwoman Mirra Alfassa, who came to Pondicherry in the 1920s. With a current population of around 3,000 composed of 60 nationalities, the community functions under the umbrella of the Auroville Foundation through an act of Indian Parliament. The auditorium, also known by its Sanskrit name of Bharat Nivas, is one of the oldest buildings in the community, forming part of the Pavilion of India located in Auroville's International Zone.

'When I arrived 25 years ago, the auditorium was OK visually but not in terms of acoustics and equipment,' remembers Sound Wizard director, Didier Weiss, a former studio owner and sound engineer from Paris who moved to Auroville in 1994 and built up an acoustic design company within the community.

Bharat Nivas was designed in the 1970s by an Indian architect who, like many others at that time, was heavily influenced by Le Corbusier, the Swiss-French modernist architect known on the subcontinent for his 1950s' master plan for the Indian city of Chandigarh. The Auroville auditorium was given a distinctive design, with a roof rising up into a sharp, steep point on one side, and it was the resultant ceiling cavity that presented Weiss with his first challenge.

'The building's shape is not very suitable for live sound, especially considering that no acoustical absorption or diffusion had been provided,' he says. 'The ceiling was focusing the sound instead of diffusing it. The reflection of energy was quite uneven and it was resonating in the low/mid frequencies within the ceiling cavity.'

'The auditorium had been designed by an architect with little knowledge of acoustics. At that time in India, no such knowledge was easily available, so it was nobody's fault, but now we've been able to rectify it as much as possible.'



Bharat Nivas auditorium manager, Sai Suresh, with the Midas M32 at FOH
Image courtesy of Marco Saroldi

Phase one of the restoration project involved acoustically treating the 800-seat space to address the inherent problems; phase two would be to replace an antiquated sound system with one that would be capable of handling international-standard shows and live streaming via optical fibre and satellite. For this, a QSC system was installed after the acoustic treatment was carried out.

Weiss designed a range of acoustic clouds, each with differing absorption and reflection properties, to close the ceiling and optimise the QSC system. 'Because of the close proximity of this project to our offices, we were able to work in a lab-type situation,' he says. 'We considered each cloud to be a separate entity, and they were manufactured locally, so we had a lot of control. I did all the acoustic simulation in AFMG

SoundFlow simulation software to get the material properties correct, then imported it into EASE to see where the energy would go. There are three basic types of cloud, with differing degrees of absorption and reflection within each type. If they are positioned next to the line array, for example, they would need to have a different acoustical response than if they were at the back or in other parts of the auditorium. So it was more complex than the usual situation where you would only find one or two different types of acoustic panel.'

When it came to a loudspeaker design for the acoustically improved venue, Weiss chose to install an L-C-R system of three clusters of five QSC WL2082i installation line array cabinets, which handle frequencies from 80Hz upwards and provide wide horizontal coverage, powered by three PLD4.5



Sound Wizard's Didier Weiss

DSP amplifiers. The main system is reinforced with two flown subwoofer arrays in cardioid mode, each consisting of three GP212-sw dual 12-inch flying subwoofers, also powered by PLD4.5 amps. Weiss used the DSP within the QSC amps to time-align the system, set up suitable EQ and limiters, and provide presets for different styles of productions.

The subwoofers were initially ground stacked, but this was found to create too much low frequency onstage. 'We then planned to fly them as a centre cluster to improve the isolation onstage, but I looked at deploying the subs in cardioid mode, did the simulation in EASE Focus acoustic modelling software and was blown away by the possibilities,' Weiss recalls. 'We worked out the specific positioning, with one box flown quite high above the other two boxes, all stacked on top of each other, with the central one firing

backwards. This configuration creates a modified cardioid pattern that can reach the back seats while not blasting the front seats too much, and shading the stage area by a factor of 15dB. This means you can put a mic on, say, a bass drum and there's much less chance of feedback.'

The situation was further improved by attaching the subs directly to the building's concrete shell rather than the metal truss to avoid vibration and rattling.

A horizontal array of four QSC ADS8 small-format, surface-mount, front-fill speakers have been installed along the front of the stage. Onstage monitoring is provided by Nova KD 12 self-powered wedge speakers, and a Midas M32 mixing console has been installed at front of house, in a central position that Weiss created for it. 'This is rare because quite often in India the mix position is put off into a corner or to the side,' he says. All equipment is connected using Sommer cabling.

Weiss, who used EASE extensively in his acoustic simulations and predictions for the auditorium, trained to be an EASE instructor six years ago, and is now the EASE trainer for Southeast Asia and the UAE. However, as is always the case when translating software predictions into real-life situations, it wasn't until the acoustic treatment and QSC system had been installed and measurements could be carried out that he could discover just how accurate his predictions had been. Fortunately, in the case of Bharat Nivas, real life readily complied.

'The onsite measured parameters of RT60 across the frequency range within an average of 0.6s, as well as the quantity and quality of early reflections, were shown to be quite close to the ideal parameters that we initially set as a goal, and that we had achieved within the computer with EASE,' he says.


Entering its sixth decade, the community of Auroville now has a world-class auditorium in which to stage a variety of productions. 'In the high season, every weekend there's something going on there: plays written, directed and performed by the community, as well as rock, jazz, classical and choir concerts,' says Weiss. 'And, as it's the Pavilion of India, there are a lot of cultural and traditional performances.'

Mme Alfassa would surely be proud of what's being accomplished in her utopian community by the judicious use of modern technology.

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