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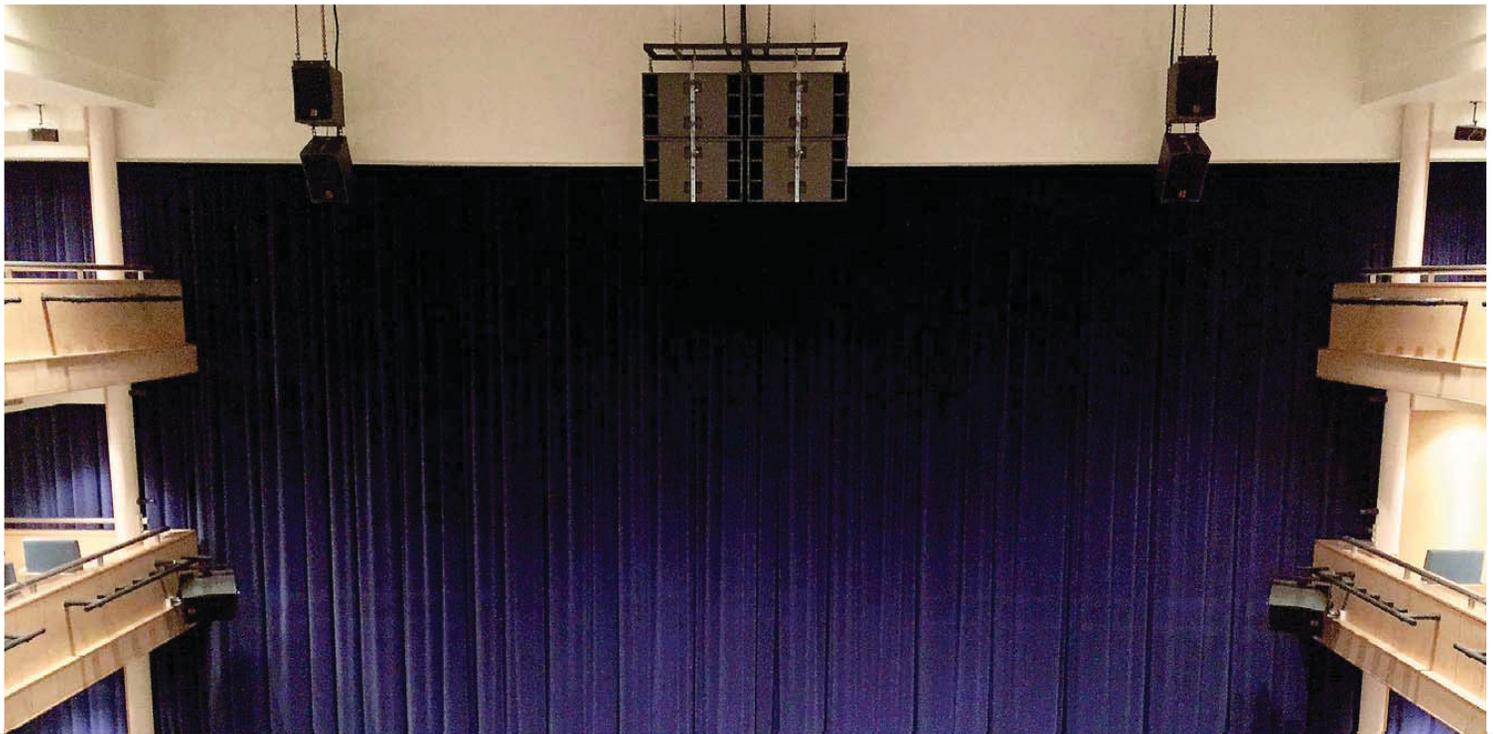
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Originally designed as an unamplified black box, the 450-retractable seat Theatre is today used for orchestral performances, concerts, opera, dance and musicals

Stereo imaging in the stalls has been created by fixing two i12 speakers to the lip of the first balcony on either side and angled towards the central seats

The FOH i12 and SB118 system together with the six NF8 surround speakers are powered by a total of five Norton Audio ND2 amplifiers

Two Norton Audio i12 cabinets are flown per-side with supplemental low-end via centrally flown SB118 subwoofers

The Cultural reference

Singapore's UCC Theatre has a new audio system while an up and coming brand has a powerful reference project, writes **Richard Lawn**

LOCATED ON THE GREEN LANDSCAPES

of Kent Ridge in the National University of Singapore, the University Cultural Centre (UCC) has served as a key performing arts venue for over a decade. Managed by the NUS Centre for the Arts (CFA), UCC has been a vibrant, innovative space for university and national-level events as well as performances by local and international artists. In January 2015, Singapore's audio suppliers were invited to tender for a new loudspeaker system to be installed into the UCC Theatre, an intimate 450-seat space.

UCC Theatre is an exciting venue for both artists and audiences. Fully retractable seating and lighting bars encourage innovative staging configurations, allowing creative teams to realise a variety of performances. A versatile and flexible space, the theatre's intimate construction facilitates a greater degree of resonance, significantly benefitting performances which have unamplified speech and music. The retractable seating set in the modified horse-

shoe design below the circle levels can be removed to create an extended dance floor, sound cockpit or orchestra pit.

Following full loudspeaker demonstrations and evaluations, the design proposed by Concept Systems Technologies was selected. This followed an initial listening test encompassing a broad variety of music, all of which was played back on the Norton Audio i12 coaxial loudspeaker system demonstrated by Norton Audio Asia. The system immediately won praise with those present describing it as sounding 'natural and precise'.

The design itself is a simple L-R system with each side comprising two 800W RMS rated Norton Audio i12 cabinets suspended from the ceiling. The top i12 focuses its energy on the balconies while the lower cabinet is angled as a down-fill for the retractable seating in the stalls. Even coverage and stereo imaging in the stalls has been created by fixing two i12 speakers to the lip of the first balcony on either side and angled

towards the central seating area.

An important consideration for the project was that the stage should be visually unobstructed, ensuring that patrons can enjoy the best possible experience. To deliver on this requirement, Gerald Fong, senior sales project manager of Concept Systems Technologies, proposed suspending four SB118 single 18-inch subwoofers from the ceiling on a T-bar in the centre of the 11.8m high proscenium, well out of any sightlines. The crossover has been set at 80Hz and low-frequency extension can reach down to 28Hz. Powered by two ND2 amplifiers, a further six Norton Audio NF8 8-inch coaxial speakers can be added as monitors, side-fills or for surround sound. The front of house speaker system is powered by a combination of three Norton Audio ND2 amplifiers, whilst a Yamaha CL5 digital console – located in the rear control room – is connected to the stage-box via two Cat-6e cables.

For the front fills, four K-Array KAN200+ Anaconda speakers were supplied and

can be used flexibly as per the venue's needs. Each module is 2m in length so can be extended to 8m in total, depending on production requirements. Concept Systems also overcame space constraints to provide a combined monitoring and front-fill solution which provides intelligibility. Operating within a 150Hz to 300Hz frequency range, each 300W module consists of 16 1-inch transducers, which can be twisted and shaped as required to provide 160-degrees horizontal x 10-degrees vertical dispersion.

'To date this is perhaps Norton Audio's best reference,' assessed Mr Fong. 'We were up against some very stiff competition during the demonstrations, and the 10- and 12-inch coaxials probably looked too small to some observers, but they are very powerful and offer great headroom, delivering high power with a compact design.'

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