

System Description

We have proposed a system based around JBL's new, reference-class A8 compact line array system. This 4 element per side design should offer impressive performance both in terms of accuracy and potency and feature JBL's new and patented transducer and waveguide technologies.

Hanging positions can hopefully be provided L&R in front of the stage as per the images in the acoustic models we provided. These locations have been picked with the intention of maximising direct sound coverage of the audience whilst minimising the energy reaching the reflective side-walls. Although side wall reflections are not typically the most problematic, their secondary reflections will quickly sum up into the reverberant field and reduce intelligibility. In its current location, the PA system is spaced wide of the stage and close to the side walls of the aisles. This leads to a relatively lesser amount of direct-sound summing of the left and right system, whilst focussing significant energy on the side walls.

To support the A8 main system, we are proposing a subwoofer array of 4x JBL B18's. These compact single 18" systems are the latest in JBL's transducer and cabinet design and provide similar or greater output power in the mid-bass frequencies to our last generation of twin 18" subs which are over double the size. As well as offering next-generation standards of performance, these units have been designed specifically to partner with the A8 mid-high elements.

By using the steered bass array shown in the supplied prediction mappings, we should be able to couple the LF into a coherent arc of bass focussed at the primary audience areas. Again, this should put the energy where it is wanted and minimise loss of energy into areas where it isn't. Currently the wide left and right sub locations create a narrow 'power ally' up the centre of the room with a further energy centre directly in front of each sub. Because of the width of the spacing, these distinctly separate 3 areas do not couple evenly, resulting in a very uneven response throughout the space with unpredictable results on-stage. Experience in the venue corroborates the mapping predictions for the existing system.

Powering this system are Crown's range-topping I-Tech HD 4x3500 amplifiers which leverage patented Class-I technology to provide the power density, efficiency and light weight of class D designs whilst mitigating against the distortion artefacts inherent in amps of this type. Huge current and damping factor are also available to ensure taut, controlled and accurate response even when used with large, high power drivers. BSS's Omnidrive processing is provided on-board for delivery of presets and system tuning and calibration

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A BSS Blu100 has been suggested as the main system controller. This DSP unit is fully 'open architecture' and therefore offers complete flexibility for the programmer to create recallable custom routings and system optimisations to fit the various applications of the room and equipment layouts. Like the amplifiers, this unit features BSS's Onmidrive algorithms for maintaining optimal phase and time coherence when system tuning.

Concern has been raised about the potential for the system to interact with and change the room's acoustic characteristics which are important for the classical and acoustic performances. Although we are not in the position to offer acoustic consultancy, we would not expect there to be a discernible detrimental effect to the nascent room acoustics. These cabinets are too small and relatively acoustically inert to make an appreciable change to the reverberance of the room when you consider them as functions of the volume of air in the room and area of the reflective surfaces within it. Any additional articles placed in the space will make some difference to the complexity of the reflections and have some damping and scattering effect, however these typically need to be over a large area to make any significant difference.

Assuming that the system were to be installed on hoists, it could be raised up out of the way during acoustic concerts.

We discussed the location of the bar and mix position and the possibility of adding additional acoustic treatment to the room. If the bar were to move to the side at the rear, this would take it off-axis from the main PA. This should make it easier for staff and audience to hear one another when ordering drinks. This can have beneficial effects for wet sales and reduce exposure of staff to the highest SPL levels. This area of the space also acts as a bass trap and is therefore not a good or representative location for engineers to mix from.

If mix position were to move to where the bar was in the centre-rear of the room, you should gain valuable space in the core audience area. However, the curved rear wall is general concern acoustically and one which will potentially have a particularly significant effect on this location. Some kind of removable damping either directly behind mix-position or on the rear wall should help in this regard. Covering this area will have an effect on the room acoustics, so ensuring it can be removed for acoustic and classical performances could be an important consideration.

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Both the apse and the rear curved rear wall are likely to cause a focussing of reflections back into the room. Any measures to damp and mitigate these will only help. Sound on stage has also been noted as a challenge. In addition to the Treatment in the apse area, there was a suggestion to add further draping to the rear stage wall too to reduce reflections both from instruments and stage monitors back into the mics, audience and general reverberant field which may help with gain-before-feedback on vocal mics and general intelligibility. The effect will probably not be pronounced, but a useful 'small gain'. Similarly, rather than rely solely on floor monitors, using a pair of 'stage fills' is a popular technique in a lot of good venues and allows a general balance of what every performer needs to be fed through at a sensible level, and aimed down and across the performance area so that floor monitors become supplementary for just the performers who really need them. We also discussed the possibility of adding a 'monitor shelf' around the sub array. By slightly raising the monitors, less total output should be necessary which could also help in this regard.

The above observations are made entirely based on experience and theoretical acoustic modelling and are included only as suggestions that could be tried. We cannot give qualified or quantified advice on the acoustic environment of the venue because as the representative of the manufacturer, we are concerned with direct sound modelling only. This is used to ensure that our systems are deployed in a way that best suits the application and space, but stops at the point of first interaction with the audience. We do have relationships with a number of good acoustic consultants if you wish to go further with this.

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