MUZA Kawasaki Symphony Hall's Sound System

By Motoo Komoda

The primary purposes of the MUZA Kawasaki Symphony Hall sound system are to provide an in-house paging and public address (PA) capability and to amplify speech intelligibly for lectures and ceremonial events. For events that may require other loudspeaker equipment, we made the assumption that the events' organizers will either use the hall's portable loudspeakers or bring their own additional equipment.

Types of Loudspeakers

MUZA Kawasaki Symphony Hall has a system of multiple individual loudspeaker units distributed across the hall ceiling and a suspended loudspeaker cluster. In addition to these loudspeakers, the concert hall has fixed loudspeakers at the sides of the stage, at the front of the stage, and hung from the undersides of the balconies. These support loudspeakers either provide additional sound amplification to specific sections of audience seating or feedback monitoring to the person speaking on stage. Which support loudspeakers are appropriate to use in a given situation should be determined on a case-by-case basis depending on how the acoustical curtains are deployed, whether all the audience blocks are occupied and the configuration of the microphones being used.

PA Loudspeaker Use for Classical Concerts

For the typical classical music concert, paging and other PA announcements will rely on the 33 loudspeakers embedded in the ceiling. The accompanying drawing depicts the placement of these loudspeakers and the direction of the sound each loudspeaker generates.

The embedded ceiling loudspeakers are installed above the ceiling so that they are not visible to the audience. The openings for these loudspeakers are covered with a net-like fabric that helps to disguise them from view.

After the completion of the hall's construction and since the hall's opening, I have had several opportunities to check the performance of these loudspeakers when used for PA announcements and speeches from the stage. In this auditorium, with acoustics characterized by a long reverberation time, the loudspeakers provide ample clarity and performance for their intended purposes.

Large Loudspeakers for Lectures

We installed a total of 10 large, hanging loudspeakers in the hall for use during lecture programs, 5 on each side of the auditorium. These loudspeakers are visible to the audience when they are in use. When they are not in use, they can be raised above the "canopy" of large ceiling reflection panels so that they are out of sight. In the accompanying photograph, the loudspeakers are shown in their lowered position. The white bands seen behind

the loudspeakers are acoustical curtains set along the stage rear, and the small black fixtures hanging from batons are additional stage lights. I have confirmed through listening experiments that these large loudspeakers provide effective and clear amplification in the hall, without any sense of compromise. The deployment of the acoustical curtains plays an important role in abating the hall's reverberation for this configuration.

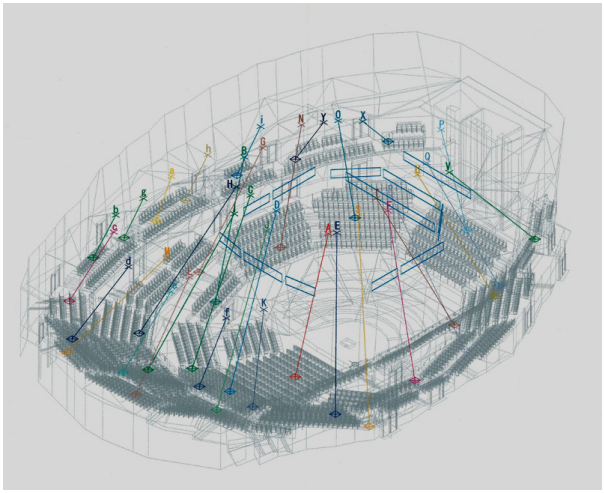

Figure 1: Placement and Direction of Ceiling Loudspeakers

Figure 2: Canopy, Loudspeakers, and Curtains

Other Sound System Equipment

Here is a survey of the hall's other sound system equipment. The hall has a digital sound mixer, which is connected via an optical transmission line to a console at the left stage wing. The hall is also equipped with a portable, analog mixer for use during recording sessions.

The most anticipated use of recording microphones is for the recording of orchestral performances. For this purpose, we equipped the hall with a hanging, six-channel, three-point microphone and with six single-point hanging microphones disbursed in six locations. All of these microphones are suspended directly from the ceiling.

For TV broadcast capability, we anticipated that the TV station's broadcast vehicle will be parked in the garage below the hall, and we ran optical fiber for the camera, coaxial cable and sound transmission lines from the garage to the sides of the stage and then to the locations in the audience seating where the TV camera will likely be situated. The hall is ready for transmission and receipt of both video and sound signals.

The hall is also equipped with intercoms, closed circuit TV monitors and dressing room occupancy indicator lights. These items have both wired components and wireless handsets that provide full and flexible communication capability between the back-stage areas and other parts of the auditorium building during performances and rehearsals.