

SMT S-Wing and Yamaha AFC3 at the Rehearsal Stage of the Royal Swedish Opera

by Lars-Göran Ehn

The simple yet astonishing bottom line of the installation of SMT S-Wings in combination of the Yamaha AFC3-system at our rehearsal stage facility is that we turned a room that was considered pointless for our musicians to rehearse in into a hall in which they now enjoy making music. In short: it used to be really bad, now it's really good.

Working with an orchestra and singers at this level is rather critical when it comes to acoustics and we knew from the start that the demands of sonic quality would be very high. Moreover, involving microphones and loudspeakers for acoustics still meets a lot of scepticism, thus raising the demands of critical listening even higher in coming up with an electro-acoustical solution. It seems that the AFC is breaking new ground in that aspect with this success story.

In our case I think the success sprung from a combination of the great attention to detail in the tuning process that was done by the experienced Yamaha-team lead by Mr Watanabe supported by the thorough knowledge of speaker system installation and tuning brought in by Audile Electroacoustics. All in combination with the custom designed portable diffusion panels based on the S-wing diffusers by SMT.

Even though the acoustic situation for the rehearsals of the Royal Opera Orchestra was an urgent matter there was a lot more to consider when looking for solutions. The room is used daily for staging with the ability to set up most of the full scale sets if needed and in the coming year we will see a whole new use of the room by turning it into a black box style venue with the intention to make Opera without the natural restrictions set by the golden auditorium in the Opera House. Changing from musical rehearsal to show to staging should also be fast and possible for a small group of people to manage.

The renowned Swedish acoustician Ingemar Ohlsson had done measurements and suggested a large hard ceiling covering the floor along with diffusion walls on the sides for greater stage support but the idea of suspending a solid hard ceiling did not go hand in hand with our plans of creating a modern style black box venue with lighting trusses and flexible set layouts of the room. Our solution had to be very flexible and quickly adjustable and, well, in certain situations it should even be possible to turn the acoustics off completely. Furthermore, anything suspended from the ceiling could not come further down than the 8,5 meters which is the maximum height of our set pieces.

As I had recently heard of the newly developed S-wings from Swedish manufacturer SMT, also suggested by Ohlsson, I began thinking of some sort of portable solution with S-wings on wheels but I still was not sure how to keep hold of all the musical energy that literally went up into the absorbing ceiling over the grid at 17 meters height. It was at this point that I got news of Yamaha having thoughts of maybe bringing the AFC3 to the European market. They agreed on working with

us in this development and the process was greatly enhanced by the fact that the certified AFC3 partner Audile is resident in Stockholm.

The acoustic design solution we came up with is, in summary, based on early stage support by the SMT S-wings which, due to their wide frequency range diffusion with time delay and almost no absorption, creates a high degree of definition and direct communication in the early energy. Then the AFC adds later arriving early reflection support and the reverb tail. The regenerative process seems to glue it all together and the response is linear regardless of level and very even across the room. The S-wings create magic in the very early time range, I believe that this is key to the sonic impact of the complete system. We were able to move the panels really close to the musicians and the response was still very even. In the near field I get a feeling that they're acoustically invisible, in the far field the summing effect of the panels help keeping the the musical energy of our singers constant even if they move around in different directions in staged passages. Communication between sections of the orchestra is enhanced without losing direction and definition.

We all held our breath when the orchestra played the first notes in their new acoustic environment but in very little time everyone had their complete concentration in the score. Playing was easy and communication between parts was much improved. In the evaluation with chief conductor Lawrence Rennes the main concern was not the quality of the acoustics but rather how to hold back the liveness of the room so that it would not be too different from our main stage, all without losing the great musical communication that we had made possible. It was a great joy.

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