

# Proposal to Upgrade Speaker System in 101

## **The Challenge:**

The current PA in 101 does not provide adequately for the needs of the room. For Student Ministries, it does not provide sufficient sound levels for their worship (as evidenced by the amps and drivers blowing out ever year or so), nor does it provide adequate coverage for larger groups such as Women's Bible Study. In the later case, the sound is either too loud in front or too quiet in the back. The acoustic renderings at the end of this document will illustrate the current issues we face.

Additionally, the current speakers are not hung properly. Instead of using correct rigging materials, they are flown with lighting safety cables and connected to non-fly rated hardware.

The other issue is that for some, the system is too complicated to run. For simple events, one or two mics plus music or video playback is typically all that's required, and some new tools have become available to make the system easier to use.

## **The Solution:**

The proposed fix for the system contains several elements (and provides additional benefits, detailed later). First, I recommend we replace the existing JBL main speakers and subwoofers with new, self-powered speakers from either QSC or Electro Voice. This change will deliver a significant improvement in both sound level and sound quality for Student Ministries.

Second, I propose replacing the existing DBX DriveRack PX system processor with a new Symetrix Jupiter 8. The Jupiter offers several advantages. In addition to providing full main speaker processing (room EQ, feedback control, system limiting) it also enables us to add two rows of delay speakers to fill in the coverage for the back half of the room.

The other benefit of the Jupiter is that it can be used with wall-mounted remote controls to provide simple level control of wireless mics and music playback. It can also be programmed to change settings presets as calendar events. For example, we can program it to switch the delay speakers on for Tuesday mornings when they are needed, and back off for Jr. High on Wednesday. These presets can also be manually changed using a second wall control. For simple events (the Boy Scout meetings for example), we can program a special event that switches the system to wall-control only to make it easy to use.

The third element is to add delay speakers to fill in the rear of the room. We currently have four EAW JF80 speakers in stock that used to serve as front-fills for our main auditorium. They have been removed since they didn't serve that job well. With the addition of readily available fly hardware and an amp (that we also have in stock) we can fly those speakers to even out the coverage for events that fill the room.

**The Cost:**

As of this writing, the cost is a bit of a moving target. We're currently waiting for demos of the new EV speakers that were introduced at NAMM. Right now, I estimate the total cost for the project should come in between \$5,500-6,500 (plus tax and shipping). The range is due to differing speaker costs.

We have \$3,000 in the budget to replace the main speaker system in 101, a figure that was estimated to simply replace the main two speakers. As we are currently significantly under spending in several other key areas, I believe we can move forward on this project without pulling funds from somewhere else, or going over the tech budget for the year.

Additionally, we currently pay a sound tech approximately \$2,500/year for First Appointment. This new system would be easy enough that any of the leaders could turn the mic on and off, and the labor cost savings offsets the difference between what we budgeted and what the upgrade will cost.

**Additional Benefits:**

Once we pull the existing speakers, subs and speaker processor from 101, we can put all that together as a travel/portable system. With the addition of a few inexpensive wireless mics, we'll have a system that can easily handle events like High School Winter Camp, Women's retreats, outdoor events in the parking lot, etc. Currently, we typically pull gear from 101 or the auditorium to accomplish those events, which can cause some issues if the equipment is needed while the event is taking place.

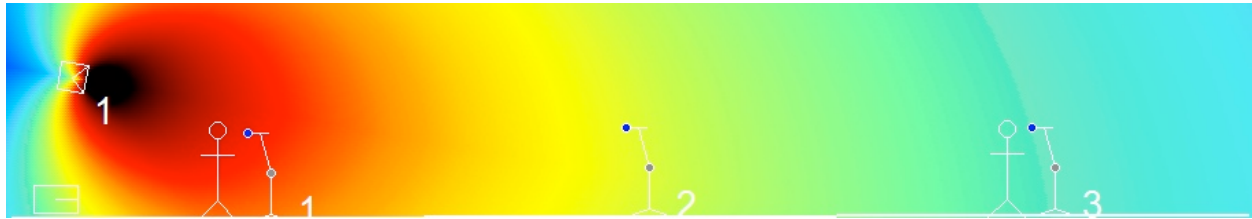
**Timeline:**

I propose we move forward with this project in phases. The first phase would be to purchase the Jupiter processor and wall controls, and the required mounts for the JF80 delay speakers. We can begin installing those as soon as practical.

The next step would be to get a demo of the speakers under consideration, make a final determination on which ones to go with, then purchase and install them.

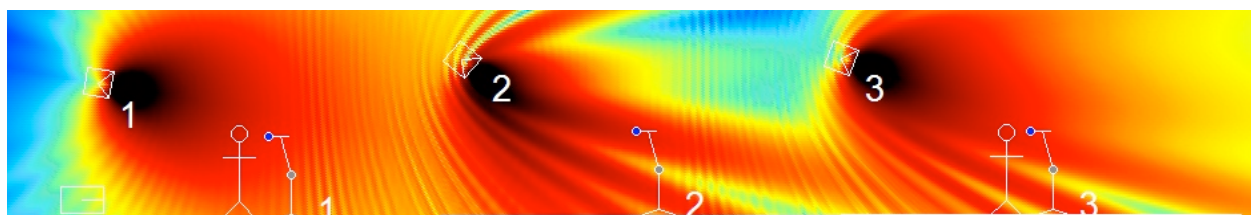
Doing this in phases requires very minimal re-work (only minor tweaking of the processor), so there is not a significant cost to not doing it all in one step.

## Current Speaker Setup Model:



You can see how loud (red) it is near the front, and how quiet it is (blue) near the back. This program visualizes the rate of falloff in the volume. The current differential is over 12 dB front to back, which means the back feels less than 1/2 as loud as the front.

## Proposed Speaker Setup Model:



This model shows how much more level we'll have in the back of the room with the two rows of delay speakers running. There is some comb filtering happening, but coverage from front to back is significantly improved.

## Options:

We do have another plan that's been designed for us. It uses some very high quality speakers that will create a very even sound field throughout the entire room. This system would consist of all new Danley speakers, and would cost approximately \$14,000. This is an expensive, albeit very high fidelity option. Given the uncertainty of future plans for room 101, I don't recommend this option at this time. However, I wanted to make sure you knew it was out there.

You can see from this rendering how even the coverage is throughout the room. The proposed system (above) won't deliver even coverage quite like this, though I think it will be perfectly acceptable for the voice reinforcement that we need to do.

