Title: PA System in a Box

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Description:
Our project is a completely self contained personal audio system that has the components required to take sound from multiple low level inputs (such as microphones, instruments, and portable devices) and reproduce them on speakers at speaker level output. We would like to build this system in order to integrate the many parts of a traditional PA system into one package. These components include mixers, compressors, equalizers, and power amplifiers which can be difficult to transport, setup, and use, especially for small or quick events, or musicians who need amplification. We will simplify the system by taking the many parts and putting them in one package, therefore making the system more portable and user friendly.

For our approach, we will be building the system modularly. Each input channel of the system will have its own gain (preamplifier), independent low-pass and high-pass filter, and equalization modules, along with clip indicators. The individual channels of the system will then enter a mixing stage that will provide panning, bussing (i.e., switching the signal from output to compressor), metering, and a summed pair of outputs. These outputs will then connect to a graphic EQ (if time allows), and the amplifier. We will also be building the power supply to provide the multiple positive and negative rails, along with 48V phantom power for microphones.

We expect that the resulting system will allow an average person to show up at their event with the PA System in a Box, connect their microphone, instrument, and speakers easily, and have full working sound with very low noise and no noticeable distortion at the flick of a switch. The additional options would also provide more experienced sound engineers with the additional functionality and flexibility required to make their event sound great.