



**CALIFORNIA STATE SCIENCE FAIR  
2014 PROJECT SUMMARY**

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<b>Project Title</b> Can You Hear That Note? A Specialized Hearing Aid for Musicians	
<b>Abstract</b> <b>Objectives/Goals</b> The goal of this experiment was to find and redesign a standard audio amplifier to fit a homemade band pass filter. The band pass filter was designed to detect the specific frequencies of a violin. Together, the amplifier and filter would be able identify and amplify the frequencies of a violin. The objective was to get the amplifier to amplify at a 85 percent accuracy level, and it was expected to amplify at a 60 percent level. <b>Methods/Materials</b> Five different schematics were put together, fitted with the band pass filter, and then tested in this project. The schematics consisted of capacitors, resistors, and other electrical parts. The diagrams were tested on breadboards before soldered. The final amplifier was tested with six different songs, and was awarded points across five scales covering five different areas of sound properties. <b>Results</b> Only a buzzing sound came from two of the five schematics, and another two didn't work. The one that did work was tested, and the results were compared to the results of a standard amplifier. <b>Conclusions/Discussion</b> The first three schematics didn't work properly due to miscalculations and the last schematic detected violin frequencies at a 63.9% accuracy level. The highest ranking scale was loudness, which meant the amplification process was successful, and the lowest ranking scale was crispness. The standard amplifier performed at a 64% accuracy level.	
<b>Summary Statement</b> I built a violinist's hearing aid from a standard audio amplifier fitted a band-pass filter and tested it in 5 areas of analysis for the sounds of the violin.	
<b>Help Received</b> Teacher reviewed report; Dr. Erika Zettner helped with basic understanding of human audiology.	