

# Enhanced hearing

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*Source:* <http://sci.tech--archive.net/Archive/sci.electronics.design/2006-10/msg06455.html>

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  - *Date:* 30 Oct 2006 11:05:08 -0800
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Good morning!

I'm trying to make an enhanced hearing circuit (kinda like Superman). For my conceptual design, I read some of the tips I've gathered from various postings in this group and also from various readings. So far, I've come up with a crude concept:

- Audio input coming from a small microphone (electret-type?)
- Output from microphone is AC coupled to a voltage follower / buffer audio op amp
- Audio op amp buffer is single supply so i will need a virtual ground in one of the input pins that will be approximately 1/2 of the supply voltage
- From the two steps above, I'm assuming that I won't have any control of the DC level bias from the microphone output
  
- My buffered signal would then be split two ways... i'm assuming i can just connect the buffered output to two different op amp inputs... part of the signal will be sent to a level detector and the other part would be the actual hearing enhancement gain op amp
  
- The level detector part would probably consist of an active rectifier with a unity gain with its output being sent to a comparator.... the output of this comparator would somehow interface to the gain op amp so I can adjust the gain if the audio level input is too high... i saw an active rectifier circuit in the Arts of Electronics book, so I think I can use that one.
  
- The gain part would consist of an audio op amp with a variable resistor for gain adjustment... but then this is where I get stuck. For the gain section, I do not know how I can amplify my audio signal without amplifying the DC component.

Since I do not have that much experience in electronic design compared to others here, I was hoping maybe you, the experienced ones, can help me answer the following questions:

- 1). How can I amplify an audio signal correctly without clipping the

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output if I use a single-supply configuration?

- 2). How can I interface the level detection portion with the gain portion? (I was thinking maybe I can use some sort of "voltage controlled resistor" if there is one as part of my gain feedback scheme).
- 3). What parameters would dominate my choice of parts for this type of application? (I'd like this to be battery powered, so I'm assuming I need some sort of low voltage, low power op amps. But I do not know how to spec out the microphone and headphones for battery applications.)
- 4). How many questions can I ask before you guys/gals get sick of me?

Thanks!

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