(Example Idea Document #1)

Your Name Here

Application Idea: Office and Lab “Hassler” circuit sound generator

Application Description: Often in the lab or office, people won’t shut up so the more productive members can do work. Therefore, I propose to create a sound hassler circuit. If people speak loudly in the presence of the hassler, it will emit a high pitch tone, which will decrease in frequency the louder the offending person speaks; this will cause an annoying, and possibly painful ringing noise in the ears. As soon as the ringing is noticed and the speaker stops talking to identify the source, the hassler stops emitting a sound. The hassler would be enclosed in a small form factor so it is easily hidden. The hassler would also need to be turned off remotely, just in case the hassler owner wanted to yell at someone. Therefore, a radio would need to be installed on the hassler circuit.

Justification: This idea is both an interesting technical challenge (detecting and generating sound with little energy) but also extremely useful. Office noise is a serious problem in academia and industry, where workers are often in close proximity. I am very interested in designing and using the hassler to combat office noise where I work.

Challenges: The small, hideable form factor presents a challenge, mainly in terms of power. The entire device will have to be supplied by a coin cell, so duty cycling will need to be used judiciously.

Stretch Goal #1, Tuned Hassling Part 1: Sometimes, that one person seems to always destroy productivity. This extension would only hassle a specific person, trained on their voice. This would require extra circuitry, such as an FFT chip, to analyze voice and respond if the offender is talking at all.

Stretch Goal #2, De-hassler circuit: Obviously, the creator of the hassler does not want to hear the hassler tone. So a special de-hassler would be worn on the headphones, collar, or in the pocket of the person. This extra chip would communicate with the hassler, and when it was on, the de-hassler would generate destructive interference (noise-cancellation) around the creators ears.

(Note: This is actually a famous “prank” device made by Bob Widlar, the alcoholic analog engineering genius and one of the godfathers of the analog IC industry. Find details here: http://www.analogzoo.com/2015/01/building-the-widlar-hassler/#more-509 )