

Resonate CW Speaker

What is a resonate CW speaker?

Its a physically tuned speaker system which peaks a tone at a certain frequency (generally 600 Hz for CW) and attenuates other frequencies, similar to what a tuned electrical circuit does.

The resonate frequency of a cylinder can be calculated with a formula similar to that used to find the resonate frequency of a dipole antenna, but instead of the speed of light, the speed of sound is used. The speed of sound is 1100 feet/second, so the formula is $L=1100/F$. This is for a cylinder open at both ends. For a cylinder which is closed on one end, the length is 1/2 or $L=1100/2F$.

If we seal a speaker at one end of cylinder 11" long, we will have a 600 Hz resonate speaker system. This is the simplest configuration, but physically, it might not be the ideal configuration for practical use. Instead of a straight cylinder, we can fold the cylinder into a U shape. This will make it wider, but will also make it shorter, so it will be easier to set it on top of a radio or shelf. One could make a resonate speaker system like this out of PVC pipe, or we can build a box. This is what I did. The box approach leads to a square sound channel, instead of round, but this seems not to be a problem. To test the idea, I made a box of foam core construction board, available from Wal-Mart and office supply outlets. This material is easy to work with, but is not very stiff. Therefore, it tends to vibrate and cause a buzz at higher volumes. I cured the problem by simply placing a steel plate on top of the box. If you have a table saw, ideally the box would be made from plywood or particle board.

Here are the plans for the box I made. Its designed for use with a 2.25" outside diameter speaker and 1/4" material. The speaker is simply mounted by hot gluing it to a mounting plate, made from the same material as the rest of the box.

