

AMPLIFIED SPEAKER FOR MP3 PLAYER by Slo-go'en

This amplified speaker fits into an Altoids sized tin box, runs on three "AAA" batteries, weighs 3.4 oz (with batteries) and can produce room filling sound with remarkable fidelity when combined with an acoustic "bass enhancing" resonator (empty plastic peanut butter jar).



front



inside



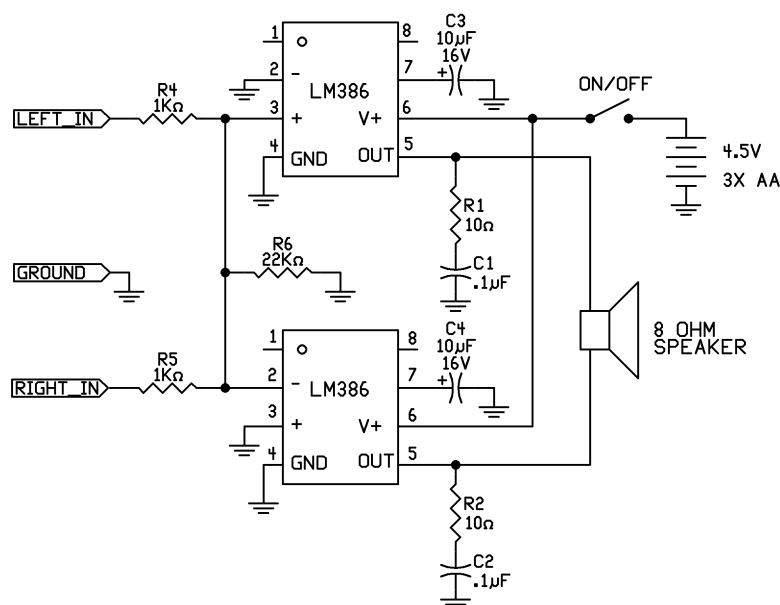
in use

As noted above, the best sound is obtained when the speaker is placed over the open top of a 18 oz. empty peanut butter jar and the lid of the tin is opened slightly. The peanut butter jar enhances the bass and the open lid of the tin enhances the treble, which comes out of the top of the speaker. As a bonus, the tin will just fit inside the peanut butter jar for transportation, so you don't need to carry an empty jar! By the way, this same idea can be used with any device with a small speaker. A nalgine bottle will work too. The improvement in sound quality and volume is remarkable.

A 2" diameter "flat" mylar speaker is mounted inside the tin. One large hole and a number of smaller 1/4" holes are drilled over the speaker to let the sound out. The speaker can not be mounted directly to the bottom of the tin, it must be spaced a little off the bottom so the cone does not touch. I used a piece of 1/4" thick foam core construction board to make a spacer for the speaker. The speaker is simply hot glued to the construction board. A piece of black felt cloth is then glued to the spacer to protect the speaker cone and make it look better. This speaker assembly is then hot glued into the bottom of the tin, over the holes drilled for the speaker. There is just enough room left to place a three cell "AAA" battery holder in the other end of the tin.

The amplifier to drive the speaker is made from two LM386 low voltage amplifier chips. These are configured as a "bridge" amplifier, where the speaker is placed between the outputs of the two amplifiers. This doubles the amount of power which can be delivered over using just one amplifier for the same battery voltage. The left and right channels from the MP3 player are "summed" by three resistors to the inputs of the amplifiers, which converts the stereo signals from the player into a monaural signal because only one speaker is used. A headphone cable clipped from a cheap pair of headphones is used to connect between the amplifier and the player.

I built the amplifier circuits using tiny SMT (surface mount technology) parts because there wasn't much room left in the tin after adding the speaker and batteries. An experienced circuit builder could likely use larger "through hole" parts and make the profile low enough to fit the amplifier over the battery holder. If you are knowledgeable about electronics and making that kind of stuff, the following schematic diagram should be all you need to duplicate this.



Foam board mounting