



Resonant Speakers

Just what the heck is a resonant speaker you ask? Well a resonant speaker operates under the same principal as a resonant antenna. It is a speaker tuned to resonate at a certain frequency. What this accomplishes is twofold, first it peaks the desired signal and secondly it acts as a bandpass filter to block out all other sounds that are not in the resonant frequency of the speaker. They really work well for receiving morse code at the same frequency as the sidetone of your rig. Used alone or in combination with DSP and other audio filters the results are outstanding! Everyone I have ever demonstrated these speakers to are usually amazed at the difference in audio that the speakers make and at the improvement in hearing weak signal stations or stations in heavy noise or interference.

I designed and built these resonant speakers using common every available plumbing parts.



Parts needed:

- 1- 2" diameter 45 degree pvc street elbow
- 1- 4" section of 2" pvc pipe
- 1- 2" diameter circle cut out of plexiglass
- 1- 4" diameter circle cut out of plexiglass
- 1- DSDP toggle switch
- 2- RCA phono jacks
- 1- 4" black 24ga wire
- 1- 4" white 24ga wire
- 1- 8 ohm 2" diameter computer speaker
- sheet of 1/32" flexible plastic (get from Hobby Lobby or similar craft store)
- epoxy glue, or hot glue from glue gun
- scotch tape

Assembly steps:

Assemble base:

Cut 1 inch off of 4" section of 2" diameter pvc pipe.

Looking down at your 1 inch section:

Drill holes for rca phono jacks at the 10 o'clock and 2 o'clock positions.

Drill a hole for the toggle switch at the 6 o'clock position

Install the rca jacks and the toggle switch TIGHT.

Use the black wire and solder the center conductor of one the phono jacks to the center conductor of the switch.

Now solder the center conductor of the other rca phono jack to the left side of the double pole switch.

Now solder the black wire to one side of the 2" computer speaker and the white wire to the other

Solder the black wire to the right side of the double pole switch

Solder the white wire to the ground post of the closest rca phono jack, cut a piece of the white wire and solder a bridge from the first phono jack to the second phono jack ground shields.

carefully glue the speaker (cone facing up) into the 1" section of pipe

Glue or epoxy this 1 inch section in the center of 4" diameter pvc circle

Assemble Horn:

Place 2" circle of Plexiglass over speaker, mark exact center of speaker on your plexiglass. Remove from your speaker and drill a 1/8" hole. Replace plexiglass over speaker and tape in place with piece of black electrical tape around the edge.

Place the 2" 45 degree street elbow coupling over the base and press to fit. (note you will have to use a razor knife to trim some of the collar to allow clearance for the rca phono jacks and the toggle switch

Assemble Slide Adjustment:

Cut another 1/2 inch piece of pvc pipe off the section of pvc pipe.

Cut the 1/32" plastic sheeting into a strip approx 2 inches wide by about 6 inches long, form it into a circle and place inside the 1/2 inch collar of pvc pipe, adjust this for a very tight fit and secure with a piece of scotch tape.

Assemble the ring and collar into the pvc horn and adjust for very tight fit. Tape the circle of sheeting in place to maintain its shape, then remove from the horn and collar and tape both sides of your plastic sheeting tube. Now glue the inside of the 1/2 inch collar and place over the plastic sheeting tube. Slide it down on the tube until it is flush with the edge. Allow glue to dry.

Final assembly:

Insert collar with slide tube into horn and base assembly.

Test:

Connect to speaker out port on your radio. Place radio in cw mode. Turn pwr off or use sidetone only and key radio.

Adjust slide in or out until you hear the signal peak.

The other rca jack on the speaker is to allow you to connect another regular speaker in line. You may find it easier to tune on a station and then switch back to the resonant speaker as the tuning is quite sharp!

Enjoy! If you like CW as much as I do a resonant speaker will really allow for you to hear better, work weaker signals, and enjoy cw ragchews even more.

Other tips: If you have a tone generator (like the one built into a timewave DSP 599y) you can play with a voltmeter and determine the peak response of your speaker. Adjust the tone and watch a voltmeter in parallel with the speaker jack. At peak voltage read the tone setting. You can try to change the peak by adding resistance in series with speaker or by changing the height of the base assembly; you will find that there is a lot of difference even in speakers of the same manufacture. So be willing to try several different types.

WARNING! Once you build one of these little guys two things will happen:

1. You will get a lot of notice during field day events (this speaker can really talk!)
2. You will get lots of requests to build one for your ham buddies.

