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Audio Tester

If you need an audio tester for the bench, here's one that's effective, simple, inexpensive, and easy to build, all good ham radio attributes. It's not a complex project, and your workmanship doesn't have to be elegant. Mine sure isn't, but it is a useful addition to the bench.



The Idea

This project started out as a way to enjoy a few hours homebrewing. Knowing that it's better to build with a buddy, I decided to try and drum up some interest in a build day among the local hams. They immediately agreed to take on a new project. After mulling over several possible projects, and weighing need and complexity, we decided to build Jim Kortege's, K8IQY, Islander audio amplifier ¹ to use on the trouble shooting bench. I'd say lab, but that would be an extreme gross exaggeration at my QTH.

Cleaning Up The Shop

The Islander Kits were ordered from NJQRP, and we made plans for lunch. Food is a must for a good building day, right? Now came the hard part, cleaning up the shop. The good stuff was moved to the walls and the junk was pitched in the dumpster. When I could see the floor again, worktables were constructed on top of sawhorses. One of my Christmas presents was opened and placed on the workbench. Speaking of the workbench, it was a major hurdle, but eventually I found the top again.

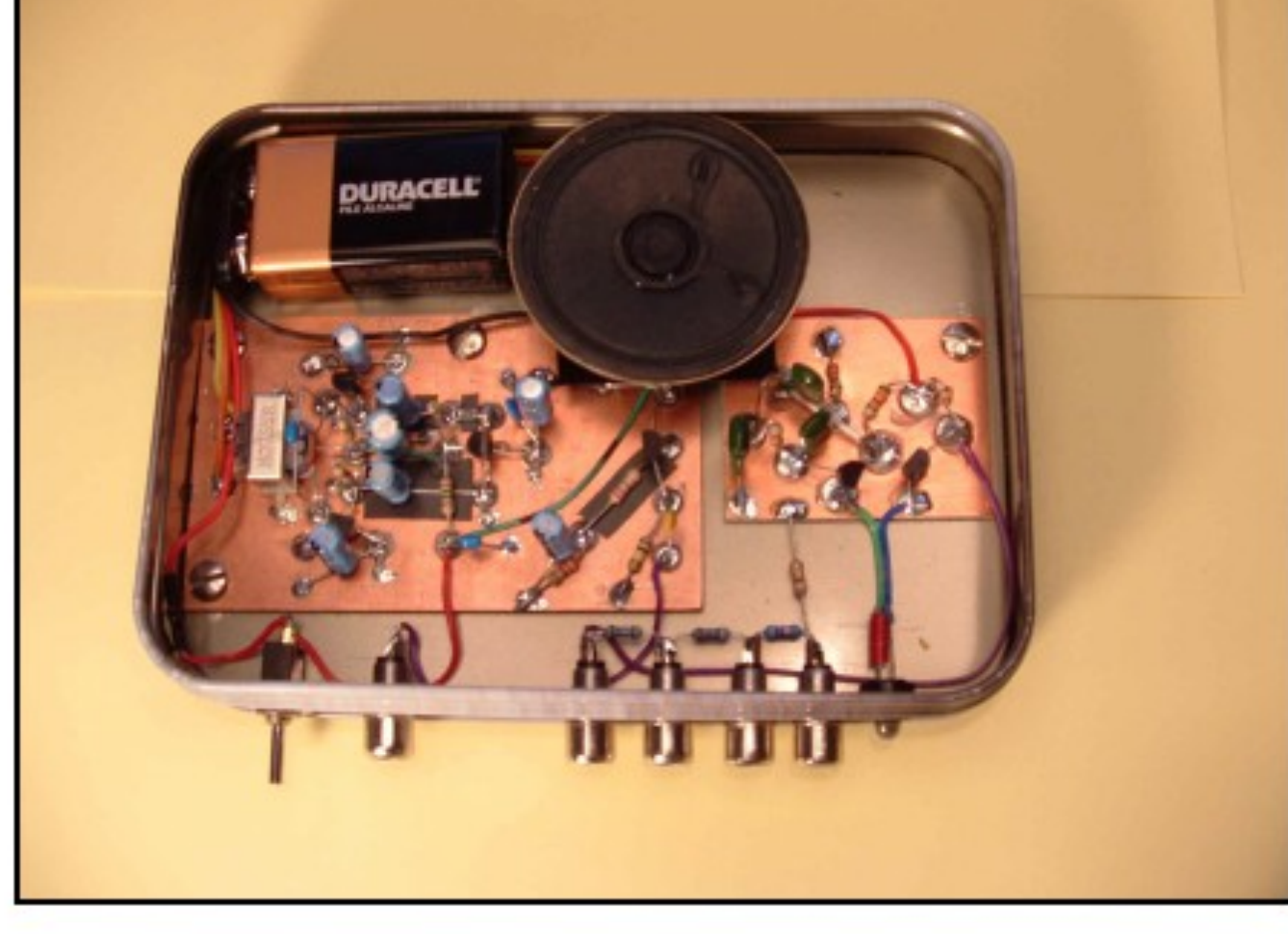
Building It

The guys arrived about 10 in the morning, I perked the coffee and donuts miraculously appeared. Lunch was started (chili in a crock pot). Then I chucked up an Island Cutter in the Christmas present. We opened the kits and jumped right in cutting islands, sorting parts, and melting solder. From previous experience we all knew that building the boards is easier than

putting them in an enclosure. So we concentrated only on getting the boards built that first day.

Perhaps the best result of the day was the camaraderie. Everyone left saying, "Let's do this again". Building alone is fine but building with like-minded friends is fun. Thanks to WA0WW, N0SM, WB0MBI, and WB0SWZ for helping jump start the project.

A few days later we gathered at WA0MWW's shop to continue. We had to breadboard an audio oscillator for a signal injector in order to check out the Islander board. While using it, a light came on my little head. Why not incorporate an audio oscillator and the Islander, in one enclosure and call it an Audio Tester, with the Islander functioning as a signal tracer? All agreed it was a good idea. For the oscillator we chose the latest version of Joe Everhart's, N2CX, Good Enough Oscillator (GEO) ². Another hour and the GEO board was born, thanks to the magic of Manhattan pads.



The GEO board is on the right. The speaker stays inside the enclosure and has adequate volume without holes in the lid.

Personal Touches

An FET preamp was added to the Islander board, K8IQY, kindly providing the design. It raises the input impedance to 100k so as not to load the circuit under test. The GEO circuit was built "stock", Both use the same 9-volt battery, and there is some oscillator feedback in the speaker. Another battery and switch would eliminate it. But it is at a very low level, hardly noticeable, so in the interest of simplicity, I'll live with it.

The GEO was calibrated to 2 vrms maximum output rather than 1 vrms as suggested in the article. . Why? No good reason, I just liked it better that way. That's one of the best things about homebrewing, make it your way!

Another little wrinkle was to use RCA phono jacks as the connections to the outside world. There are 5, one for the Islander input, and 4 for the "sorta" calibrated outputs of the GEO. Instead of using 4 output capacitors, one for each jack, I installed it inside the test lead phono plug. Switching output levels is then accomplished by changing the plug between the jacks.

A power switch was included, and the GEO led is positioned to act as a power on indicator.

Closing It Up

Part of the fun of building a small project is choosing an enclosure. I found an UNO card game in a Spiderman tin at a local BIG chain department store. The inside dimensions were 5.5"L x 4"W x 1"H, perfect - large enough but small enough.

As we all know, drilling these small enclosures has to be done very carefully, backing up the tin with wood and increasing the hole sizes gradually. I like to avoid drilling altogether, if possible. In Altoids and Whitman Sampler tins I usually use a paper punch. However, since this tin is made from a little heavier material, I thought I could drill it. But first I filled it with water and put it in the freezer overnight. The ice backed up the tin perfectly and by using stepped drill sizes, perfect holes resulted without resorting to clamps! The tin was, and still is, real cool. Neither of these techniques are original with me, I picked them up on an email list or in direct correspondence with other hams. Is QRP a great hobby or what?



Notice all the phono jacks. The signal injector and the signal tracer have different colored heat shrink tubing.

Finishing It Off

I like to make labels using Microsoft Publisher. It has both vertical and horizontal scales, and they are accurate. A box that the scales say is 2" square does indeed print out 2" square on the printer. For this enclosure, I put the functional labels on the edge of the lid, and a descriptive label on the bottom. The inside of the lid would also have worked well for a descriptive label. A good trick for laying out the position and size of the labels is to place the enclosure on a piece of paper, draw around it making an outline, then mark the locations of the switches, jacks LED's, etc. This facilitates making measurements and selecting text box and font sizes in Publisher.

These labels were printed on pastel yellow paper, covered with clear contact paper to protect the print, and stuck on with double sided tape. A black marker was applied to the edges to blend the yellow edges with the black border.



Labels dress it up and finish it with a flourish.

So there you have it. If you need an audio tester for the bench, here's one that's effective, simple, inexpensive, and easy to build, all good ham radio attributes. It's not a complex project, and your workmanship doesn't have to be elegant, mine sure isn't. But it is a useful addition to the bench.

By the way, did you figure out what I received for Christmas?

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Notes and References:

1. <http://www.njqrp.org/islanderamp/index.html>
2. QRP Quarterly, Vol. 44 Number 4, Fall 2003, p.p. 8,9

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