I Love The Sound Of Hetrodyne Whistles

M. Simon

 As I promised in Engineering Power Adventures [1] I have evaluated a kit for budding engineers from age 8 and up. The kit was kindly provided by the fine folks at Elenco [2]. It is their Snap Circuits 300 Experiments [3] kit. Actually you can probably do more than 300 experiments with the kit. But you will have to design your own circuits (not too hard) after you run out of the ideas presented in the manuals.

The first thing that is absolutely essential is to read the few pages of instructions at the beginning of the first manual (100 circuits). The snaps make your circuit sort of three dimensional. There is the base level and higher levels (3 levels were needed in the project I built) in order to make all the connections. The diagrams have the levels and placement of each component well marked so you don't have to figure out those details on your own for the circuits presented in the manuals. You will also need 4 AA cells that go into two battery holders that also connect with snaps. And if a project actually requires wires there are wires with snaps on them for the purpose. Everything is snaps. No soldering, crimping, or Fahnestock clips [4] (yeah - I'm very old school) required. And for the discrete components the actual parts are plainly visible (resistors, transistors, capacitors, a tuning capacitor) on top of the snaps that hold them. So you not only see the usual schematic representation of the components but right next to them the components too. Plus the components are identified by value and schematic designations (C4 for instance). An outstanding training tool for the beginner.

I must say that the whole concept is very well thought out and executed. So what did I start out with? Well I was into radio since I was ten and I was repairing TVs at age thirteen for pay. I got that job by working at a tube store for free sorting their inventory (it was a mess when I got there). One of the TV repairmen who bought tubes there decided I was at least a moderately bright ambitious lad and he hired me to be his helper. So yeah. I like radio. And even TV radio. TV programs? Not so much.

Which led me to snap together the AM transmitter (Project #198) that supposedly transmits your voice to the radio. And it does. Sort of. My problem was that I tried

the project out at night when there were no quiet sections of the band. The instructions clearly state that you need to tune your AM receiver to a quiet section of the band to make reception of the voice transmission clear. I couldn't find one. What did I find? Hetrodynes [5]. Lots of audio hetrodynes.

Well that was actually music to my ears. It meant that at least the RF oscillator section of the circuit was working. And my voice on the radio? Discernible - but barely - due to the hetrodynes. [insert photo here] So do I think the kit is a good thing? Absolutely. Kids can learn soldering later. Learning ideas is absolutely essential. The kit is full of projects that teach the basic concepts of the circuit elements. As an exercise for the budding engineers I would also suggest that they convert the snap drawings to an actual schematic. TinyCAD [6] is good for the purpose. It is freeware and has an easy to learn interface. The First Mate who knows what she knows about electronics from watching me (i.e. not much) suggested that. A brilliant idea honey. Thanks. Snap Circuits are a great Holiday gift idea (your choice of holiday) for kids that need a little push in the right direction. Well don't they all? You just need to get them started early enough. My Uncle Dave was a ham operator who I often watched at his rig when I was growing up. The rig was a World Radio Laboratories [7] transmitter which he got from my cousin Leo Meyerson at World Radio Labs in Council Bluffs, Iowa. I think that is where my love of air variable capacitors [8] really matured. I remember pinning over them on my Saturday visits to the World Radio Labs store. Cousin Leo is still alive as far as I know. At least he

was in 2009 when I saw him at the Simon family reunion [9] in Omaha - thanks to the Omaha Steaks guys [10] (who are also into electronics) who put it on. The steaks of course were first rate. Leo was glad to see I had progressed in the field. Uncle Dave passed about 10 years ago. I always wanted to know as much electronics as Dave did. And to be close to his height - at least. Well I wound up a couple of inches taller and with a better understanding of electronics. Thanks for the inspiration Uncle Dave and Cousin Leo. I have made a life out of it. Inspire your kids (or some one else's if you don't have any of your own). You never know where it will lead. The folks at Elenco [2] - **Leader Of Innovative Toys And Educational Devices** - are there to help.

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Links:
[1] http://www.ecnmag.com/Blogs/2011/11/Engineering-Power-Adventures/
[2] http://www.elenco.com/
[3] http://www.elenco.com/product/productdetails/snap_circuits®/snap_circuits®_300_experiments
[4] http://en.wikipedia.org/wiki/Fahnestock_clip
[5] http://en.wikipedia.org/wiki/Heterodyne
[6] http://sourceforge.net/apps/mediawiki/tinycad/index.php?title=TinyCAD
[7] http://en.wikipedia.org/wiki/World_Radio_Laboratories
[8] http://www.ecnmag.com/Blogs/2011/11/Solid-State-Radio/
[9] http://powerandcontrol.blogspot.com/2009/08/what-lips-my-lips-have-kissed.html
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