The Heterodyne

Bulletin of the West Valley Amateur Radio Association
An Affiliated Club of the American Radio Relay League

West Valley Amateur Radio Association, W6PIY— http://www.wvara.org
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July 2008

Next Meeting, Note Time: Wednesday, **7:00 p.m.**, July 16, 2008 at the American Red Cross, 2731 North First Street at Plumeria (between Trimble and Montague Expressway) in San José. Speaker: Charles A. ("Cap") Pennell, KE6AFE — Subject: "Ham E-Mail for Emergencies"

Boy Scout Hi-Sierra International Rendezvous 2008: August 10-16, 2008. A Ham Radio station will be a feature of this event and operators are needed. If you cannot participate on site, stand by for contacts. For more information please contact Gary Hendra, W6NOE, gary.hendra@comcast.net or rendezvous@scccbsa.org .

As we go to press:
WVARA successfully competed in the annual ARRL Field Day event. According to Marc, W6ZZZ, the weather coöperated, we competed well, and a good time was had by all. Thanks to the Field Day Committee and everyone else who volunteered to make our participation a success:

Field Day Committee	
Name	**Call Sign**
Jim Peterson (Chairman)	K6EI
Jim De Loach	WUØI
Tom Dunbar	W6ESL
Scott Emery	AD6RY
Dave Hartzell	NØTGD
Phil Verinsky	W6TQG
Grant Willner	AD6RE
Marc Ziegler	W6ZZZ

Club Net: Tuesday, 8:30 p.m. on our club repeaters:

WVARA Repeaters (W6PIY)			
Band	**MHz**	**PL**	**Status**
6 Meters	52.580-	151.4 Hz	Down*
2 Meters	147.39+	151.4 Hz	Operating
1.25 Meters	223.96-	156.7 Hz	Operating
0.70 Meter	441.35+	88.5 Hz	Operating
0.23 Meter	1286.2-	100 Hz	Operating
Note: *6M repeater is out of service. AD6CL is working to restore operation.			

WVARA Tuesday Night Net Check-ins:

Call Sign	Name	June 10, 2008	June 17, 2008	June 24, 2008	July 1, 2008
AB6XS	Kevin			X	X
AD6RE	Grant		X	X	
AD6RY	Scott			X	
AD6YU	Loren			X #	X
K6EBN	Eben	X	X		X
K6QFO	Mike			X	
KF6NBO	Matt				X
KF6UTE	Casey	X		X	
KG6MYR	Harry	X	X		X
KG6SGX	Jeff				X
KG6SVJ	Jeanett		X	X	
KI6RLA	Ken				X
KK6VF	Kevin	X #	X #	X	X #
N5WG	Nick	X			
N6EEE	Ray	X		X	X
N6IPS	Roy			X	
W6HOC	Howard	X			X
W6TQG	Phil				X
W6ZZZ	Marc			X	X
WB6KHP	Dave	X	X	X	X

Notes:
X — Checked into net
— Net control operator

An era comes to a close as Riley Hollingsworth, K4ZDH, retires—

On Thursday, July 3, Special Counsel for the Spectrum Enforcement Division of the FCC's Enforcement Bureau Riley Hollingsworth, K4ZDH — the man who has come to embody amateur radio enforcement — said goodbye to the FCC as he retired and began his life as a private citizen. In May, Hollingsworth announced he would definitely retire; he had contemplated retiring in January 2008, but cited "several issues on the table that I want[ed] to continue to work through with the amateur community." While his successor has not yet been named, he was quick to point out that the FCC's amateur radio enforcement program will continue.

Hollingsworth said that he has "loved" working for the FCC and has "always had great jobs, but this one involving the amateur radio service has been the most fun and I have enjoyed every day of it. I've worked with the best group of licensees on earth, enjoyed your support and tremendous FCC support and looked forward every day to coming to work. The amateur radio enforcement program will continue without missing a beat, and after retirement I look forward to being involved with amateur radio every way I can. I thank all of you for being so dedicated and conscientious, and for the encouragement you give us every day."

Saying it has been a "privilege to work with and for the amateur radio licensees and the land mobile frequency coordinators," Hollingsworth said that he is "extremely fortunate to work for two wonderful groups of people: Those at headquarters in the Enforcement Bureau, and for the amateur radio operators."

Before joining the FCC, Hollingsworth, a South Carolina native, graduated from the University of South Carolina and Wake Forest University School of Law. While in high school, he worked as a disc jockey for WRHI, an AM station in Rock Hill, South Carolina. "It's a funny thing," Hollingsworth said. "They once held a beauty pageant in Rock Hill and nobody won!" In the mid-1970s, he was a "Nader's Raider" and worked on brown lung disease in the North and South Carolina textile mills.

"Basically I'm just an ordinary guy caught in the cross-hairs of radio history," Hollingsworth said. "But I am proud of the fact that the digital clock on my VCR has been blinking for 4 years."

Hollingsworth told the ARRL he was "so very impressed" with the young people who are involved with amateur radio: "To the very young amateur radio operators I have met who have dreams of being scientists and astronauts and communications engineers, we will be pulling for you; I have a strong feeling we won't be disappointed."

Calling the amateur radio service a part of the American heritage, Hollingsworth explained that he is "going to stay as actively involved in it as I possibly can. Thank you all for working tirelessly to Provide the only fail-safe communications system on earth and for helping this country keep its lead in science and technology. What an incredible gift it has been to work with you every day, and how fortunate we are to love the magic of radio! Every gift of lasting value comes with responsibility. We must never forget what we owe for our spectrum privileges. I will continue working with you in every way I can to ensure that amateur radio lasts a thousand years."

My AM Radio's New Life— by Bill Schweber
[From *Electronic Engineering Times*, June 30, 2008]

AM (amplitude modulation) broadcast-band radio is so "old news." In this day of ubiquitous MP3 players, streaming audio, XM and Sirius satellite, AM radio is truly an anachronism. Despite the feverish promotions of commercial broadcasters, claiming that nearly everyone in the U.S. "listens" to AM radio for at least 15 minutes at least once a week (a very low bar, indeed), the role and need for conventional AM broadcast radio has severely diminished (although it does have a major place in emergency and disaster notification).

So it was with some trepidation at appearing very much "out of it" that I took a portable AM radio out with me last week, just to hear what was going on in this first electronic mass medium. (Let's not forget that development of AM receivers also drove a lot of technology, including the superheterodyne architecture of E.H. Armstrong, standardized and low-cost vacuum tubes, and much more.)

What I heard was not what I expected, but should have. Sure, I could pick up some stations when outdoors, but the radio's output when inside various buildings was another story. Signals were barely audible except near the window, and the background broadband noise was high. It was not a pleasant SNR (signal-to-noise ratio) situation.

But what really struck me were the specific sounds I heard. I used the radio's ferrite antenna, with its modest directionality, to localize many of the sounds and identify the source. There was the whine from the electric motor of a nearby service cart; you could judge its RPM (revolutions per minute) by the pitch. There were loud snaps from switches in nearby heavy machinery. PC (personal computer) power supplies and display oscillators added their own grinds. There was splatter from cell phones in use in the area. Many I couldn't make out; some were constant, some intermittent.

It was not a pretty (audio) picture. I actually felt bad for the AM radio world, given its long and honorable history and place in society. Of course, it's not the modulation that is the primary problem, although AM has very little noise immunity. It's mostly the frequency band used for broadcast AM, from about 500 to 1600 kHz, that is the problem.

I could have decided to toss the radio in the pile of semi-obsolete but still-functioning electronic stuff I have. But in today's world, it's all about spin and repositioning your assets and attributes. I took out my Brother electronic labeler, made up an 18-point-size label that clearly announced "500- to 1,500-kHz RF Sniffer," and felt I had done the radio justice. But maybe, in keeping with the reality, it would have been more appropriate to use my venerable Dymo label maker.

Old Test Equipment— by Pellervo Kaskinen
[From *Electronic Design*, June 26, 2008]

I have been collecting some new but mostly museum-grade test instruments. Along with purchases from various instrument rental houses, flea markets, and so on, for a while I bid on items in government liquidation auctions. Occasionally, I won. The starting bid was always $50, and some I got at that price. Some went way higher but seldom approached the original list price, and I gave up way before that. Often, the shipping costs to a pickup and forward agent were more than the purchase price.

Last year, the government changed the rules and started wanting something called EUC (end use confirmation, or whatever) on anything of interest to me. I filled one of those pain-in-the-you-know-what "Paper Work Reduction" forms. Then I stopped buying anything more. To my astonishment, during the past few weeks, I have been demanded to fill in more forms for purchases in 2006 as well as 2007. The items included a Fluke 8060 handheld DMM (digital multimeter).

Worse than that, I had to return an HP 3400A true RMS (analog) volt meter. It had been suddenly reclassified as a Class "Q" item, which means that it had to be destroyed when I returned it.

Apparently, in their great bureaucratic wisdom, somebody has concluded that this 1960s technology is dangerous to U.S. national security! Yes, it has this marvelous 10:1 crest factor, when the present day handheld DMMs only have 3:1. But is that a good reason for becoming a secret? Or is it the neon tube chopper/demodulator, which is the one aging component in the design? Or maybe the government is in dire need of the nuvistors. There is one in the front end of this meter.

As it happens, that model of meter was the very first item that I convinced my at-that-time employer in Finland to purchase for our engineering group. We needed it when we developed SCR-based motor drives for our manufacturing machinery. It was around 1968. So, it was in free distribution worldwide, eventually made obsolete, and now is a dangerous secret. How could Bill Hewlett and Dave Packard ever have guessed?

Oh yeah, that meter was part of a three-item lot that I won at $50. The refund I'll get is prorated with the original price ratio of all items in thelot. I think I'll get $7. The over $200 that I paid for agent services would be treated the same way, prorating, if I had a receipt. The only place that receipt appears is on my credit card statement, but that included actually two lots at the same time — not likely to be sorted out if I even tried.

Another item that I can imagine a little better being recalled is a TEK 1502 reflectometer that I got in a March 2006 auction. There was no mention of destroying it in the recall. I think it is the version that still contains a tunnel diode "heart." When did you last try to buy a tunnel diode? So maybe even the government can't waste any of them.

The Art of Approximation— by Bill Schweber
[From *Electronic Engineering Times*, June 16, 2008.]

A large part of science and engineering work requires equations that model and analyze various situations. In many cases, such equations soon become complex and hard to resolve or solve analytically. While we can almost always number-crunch and solve a given equation numerically, that approach does not provide the insight than an equation-based, analytical solution offers.

That is where approximations help. The most basic and useful one is to replace ***sin x*** with ***x*** itself for small angles (***x***, of course, is in radians). Using this approximation, many complex equations can be simplified and solved analytically. There are many widely used approximations, but ***sin = x*** is among the most common.

Of course, the challenge in using any approximation is to understand its limits. One person's "small angle" is not so small in another's application. The ***sin x = x*** approximation has about 1 percent error at ***pi/16*** or 0.2 radian (about 13 degrees), and 1 percent may be good enough for a valid solution in some situations but terrible in others. You also have to watch out for cumulative effects of approximations, and cases where the analysis is very sensitive to errors at certain points, with sensitivities that the approximation may aggravate. If you use multiple approximations, those are potential problems as well, since the errors can cascade and cause a far greater final error result.

On the other hand, if you are looking for the nearest standard 5 percent resistor value, your results may be just fine even when using a few modest approximations and simplifications.

Understanding what the numerical analysis and approximations imply is what good engineering is all about. It is all about careful use and understanding of the tools you have at hand when doing analysis, making measurements and drawing conclusions.

West Valley Amateur Radio Association

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