

# Letters to the Editor

## A Low-Cost Atomic Frequency Standard (Nov/Dec 2007)

Hi Larry,

I am building John Raydo's frequency standard. The little rubidium locked oscillator is working just fine on the bench and I'm busy installing it into a suitable Ten-Tec enclosure. Nifty! I think I'll add a little LCD panel meter to monitor the operating parameters of the frequency standard unit.

Thanks for the very nice article in *QEX*, and keep up the good work.

— Best regards, Bob McCulla, K7HBG, 5025 E Pacific Coast Hwy 340, Long Beach, CA 90804; k7hbg@dslextreme.com

Hi Bob,

Thanks for your kind words, and the note about this project. It's nice to know that readers find some of our projects helpful.

— 73, Larry Wolfgang, WR1B, QEX Editor, lwolfgang@arrl.org

## A New Subscriber

Larry,

I just subscribed to *QEX* and received my first issue (Nov/Dec 07).

Great job! The publication is awesome! How much for ALL the back issues? Well... I likely can't afford that...

Thank for your hard work. I can't wait to get the next issue.

— 73, Steve Niles, N5EN, 11215 Monique Dr, Houston, TX 77065; n5en@arrl.net

Hi Steve,

Thanks for letting us know you enjoyed your first issue! We do have some back issues available, although not all of them. Back issues are \$5 each, if there are a few particular articles of interest. Another solution for having a more complete collection of back issues would be to purchase the 1981-1998 *QEX* Collection CD-ROM (\$39.95) and the annual ARRL Periodicals on CD-ROM from 1999 to the present (\$19.95 each). The annual Periodicals CD-ROM includes all issues of *QST*, *QEX* and *NCJ* for that year. Back issues are available from ARRL and the CD-ROM products are available directly from ARRL or from your local ARRL Dealer. Call 888-277-5289 or go to [www.arrl.org/shop](http://www.arrl.org/shop) to order.

— 73, Larry, WR1B; lwolfgang@arrl.org

## Empirical Outlook (Nov/Dec 2007)

Hi OM,

I saw your comment in *QEX* (Nov/Dec 2007, p 2) on experiencing the BASIC Stamp. I used to use that product but then came upon what seems a far easier one to use and at less cost, too — the PICAXE units. This is also a PIC microcontroller with an on board BASIC interpreter. For \$4.00 or so you can get an 8 or 14 pin unit that has PWM, ADC (10 bit 3 pins), ASCII, Servo and other functions, and a very good technical support forum. The parent company Web site in the UK is [www.picaxe.co.uk](http://www.picaxe.co.uk). Peter H. Anderson, KZ3K, ([www.phanderson.com](http://www.phanderson.com)) extols their virtues and sells them. SparkFun Electronics ([www.sparkfun.com](http://www.sparkfun.com)) also stocks the product. The best deal to start with I know of is from [www.world-educational-services.com](http://www.world-educational-services.com); \$15.95 for a PICAXE 14M unit with circuit board, download cable and CD ROM.

The PICAXE was conceived as an educational product in the UK and funded by the petroleum industry to encourage young engineers — it's mainly been known and used in the UK, New Zealand and Australia, and only recently discovered by USA folks like me — through Professor Peter Anderson's enthusiasm for it. *Nuts & Volts* published a few articles and more are reported to be in the works. Many articles have appeared in *Silicon Chip* magazine (by Stan Swan, a New Zealand ham) but unfortunately not much else in USA magazines.

The programming is done with a free editor and three wire interface from a serial port (or USB adaptor) with two resistors as the PC to PICAXE interface. Many BASIC Stamp programs have been adapted to run on the PICAXE units, which as I've mentioned are less than \$4.00. They also have up to 40 pin units, which I haven't tried. I did run some 18 pin [18X] units, which have more capability and on board flash memory for about \$9.

Google PICAXE, and you will find the Rev-Ed site for manuals, free program editor and plenty more information. You can buy a starter kit for less than \$20, if I remember correctly (I started several years ago). It's quite amazing what these cheap little units can do (an early version with much more limited memory than the current 8M unit could be programmed to send Morse strings for instance).

I don't in any way want to detract from what Parallax has done since they are great — there are also many other micro controller products that are faster and with more memory and speed. The PICAXEs are, in my opinion, simpler and cheaper for beginners, which at 71 years old, I still am! These are used by the hundreds in schools by 8 year olds and up.

— 73, S. Premena, AJØJ, PO Box 1038, Boulder, CO 80306; premzee@juno.com

Mr. Premena,

Wow! Thanks for all of that information. We would certainly welcome some PICAXE projects for *QEX* from you or any of our readers.

— 73, Larry, WR1B; lwolfgang@arrl.org

## Transmission Line Paradigm (Jul/Aug 2007)

Dear Editor,

There is an error in my article "Transmission Line Paradigm," *QEX*, Jul/Aug 2007, pp 40-44. The Voltage Equation and Current Equation given on page 41 do not jointly satisfy the Telegrapher's Equations because the distance-time parameters are incorrect in those two equations. The correct equations are:

**Voltage Equation:**

$$V(d, t) = f(ct - d) + g(ct + d) \quad [\text{Eq 5}]$$

**Current Equation:**

$$I(d, t) = [f(ct - d) - g(ct + d)] / Z_0 \quad [\text{Eq 6}]$$

Beyond this glaring failure to satisfy the Telegrapher's Equations, I do not see any heavy damage done to the article by the error. Although the distance-time parameters determine directions traveled by the wave functions  $f$  and  $g$ , the directions of the mathematical waves are extraneous to the salient ideas developed in the article. In particular, the presentation of the **Two-Function Rule** on page 41 is still valid. The trigonometry for **Standing Waves** on page 42 can be reworked for the parameters given above, and it remains true that **The Rule Unravels the Riddle** on page 43.

I apologize for the error, and thank Michael McCullough, KA6QJU, for spotting it.

— 73, Richard Thompson, W3ODJ, 3755 Leonardtown Rd, Waldorf, MD 20601; rftompson@earthlink.net

## A Large Aperture, Resonant, Regenerative Frame Antenna (LARRFA) (Jan/Feb 2007)

Dear Larry,

Here is a brief follow-up to the Large Aperture Resonant Regenerative Frame Antenna article published in *QEX*, Jan/Feb, 2007:

- I have built and am operating a new version, 12.5 inches square with a 2-turn signal winding and an 8-turn tickler winding, which performs well from below 6 MHz to almost 6.2 MHz (49 m Broadcast Band). When noise inside my house is low enough, I can hear Chinese language from CRI emanating from well inside China. I can copy Radio Australia

and Radio New Zealand regularly.

(The central air conditioning and heating system in our new home blankets my listening area with “hash” when it is running. I don't want to open up this new system to install suppression, and moving the antenna and receiver is not an option. I just wait for a nighttime listening opportunity, when the AC/heating is not running and conditions are good for DX. Otherwise strong stations for news and other programs can sometimes be heard over the hash. I suspect that some of the signal I hear is being picked up by house wiring and coupled to the frame antenna. The antenna is not directional.)

- If this antenna does not oscillate, reverse not only the tickler winding but the leads to the signal winding. I don't know why, but it works.

- Leave the frame antenna winding disconnected from the electronics when not using the antenna. I lost a 2N3819 because of a nearby lightning strike. Maxwell was right. An intense electric current produces an intense magnetic field, which transfers

enough energy to my windings to kill a JFET. Replacement of the 2N3819 wasn't too hard, and LARRFA/2 is working well again.

- Relative humidity of the air around LARRFA/2 seems to have an effect on antenna gain, lowering it somewhat when humidity is high.

- My observation of gain variation with humidity is subjective only. I have no data to back it up. I have noticed that on humid days I can't push the gain as high as on dry days. On a good day, when the receiver and antenna are “peaked” on a weak signal, there is a persistent “buzzing” noise on the signal, which can be eliminated by backing the antenna gain off slightly. I can then “re-peak” and try to hear the signal. I have read an evaluation for a high gain UK manufactured active shortwave loop antenna. Apparently the same “buzzing” noise is a characteristic of that antenna. I have a lot of reserve audio gain, which helps, but the system is never completely quiet. There is always some background manmade or impulse noise.

- I may get around to building new antenna windings to work with the existing electronics with as little solid material in the field of the windings as possible. A single, self supporting signal winding with a multi turn tickler somehow suspended inside the signal winding would be good. This configuration should have a larger aperture for the same inductance. I have maybe two more feet of clear space above the surface holding the antenna to expand into.

- Go to the Internet and enter “regenerative loop antenna” on Google. You should see a reference to a Sony regenerative loop and an early regenerative loop built and operated by Vladimir Zworykin and his business partner. He dropped that idea and went on to TV.

— 73, Bill Young, WD5HOH, 4907 Grand Chateau Ln, Houston, TX 77084; [bilaquieta@yahoo.com](mailto:bilaquieta@yahoo.com)

Hi Bill,

Thanks for the updates on your antenna. I hope others will find this information useful.

— 73, Larry, WR1B; [lwwolfgang@arrl.org](mailto:lwwolfgang@arrl.org)

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