



# SIERRA STATIC



[WWW.K6ARC.ORG](http://WWW.K6ARC.ORG)

Club Repeaters	146.835; -600khz; PL 100	441.525; +6.0Mhz; PL 100
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April/May, 2013

## Next Club Meeting

The next regular meeting of the club will be Thursday, June 6th, 2013 at 7PM at Volcano Tech Center. The next regular club breakfast will be Sunday, June 16th, 8:30AM at the Waffle Shop, 543 S. Highway 49, in Jackson. This is an excellent social gathering and very popular. Guests and visitors are welcome to attend.

## President's Message

Hello and Welcome to the Amador Co. Amateur Radio Club. I hope that everyone is enjoying Spring. Our next Monthly Meeting will be on Thursday, June 6th, 7:00PM, at the Volcano Tech Center (behind the Fire Station), Pine Grove, CA. We will be discussing the upcoming Sierra Century Bike Ride (June 15th) and Field Day (June 22-23). Refreshments and snacks will be provided. It will be preceded by an ACARC Board Meeting, 6:00PM, at Pine Grove Pizza. Everyone is invited to both meetings.

We have completed our support of the Party Pardee and Mr. Frog's Wild Bike Rides. Both Rides went extremely well, due in no small part to the professionalism and dedication of our Club volunteers. The organizers are already looking forward to working with us again next year. Our Club has an excellent reputation in the bike community, and we have a great group of volunteers. Our Monthly Breakfast will be on Sunday, May 19th, at the Waffle Shop in Jackson, 8:30AM. This has been a long-running tradition of our Club, and is very well-attended.

I am very proud to be a member of such a great group. Thank you, and I hope to see everyone soon. Paul Keeton, KI6LZC President, ACARC

## From the Sacramento Valley Section of ARRL

**Bob, WB6VYH**, is our HF awards card checker for WAS and VUCC. If you need your cards verified for ARRL awards, contact Bob at [4wortmans@comcast.net](mailto:4wortmans@comcast.net). He does not count cards for DXCC.

A small MEPT (beacon) transmitter was constructed and programmed for QRSS modes on the 30 meter band. It emits around 200 milliwatts into a 140-foot long wire and I have it set up to

send my call and grid square in slow speed CW with 9-second dots and 18-second dashes in a small segment around 10,140 MHz. As monitored on remote receivers accessible on the internet, I have seen my signal in Florida, Nevada, British Columbia, and Alaska when the propagation has been right. The remote receivers are located all over the world and a QRSS computer program called ARGO is generally used to display the passband in 10-minute sequences. More information can be found by searching for "MEPT; scrubbers; grabbers" on the internet. It's an interesting project and shows what can be done with low power and simple communications systems." Thanks to Jon, K1NV.

Don't forget to set aside Saturday, September 7th for the WPARC Hamfest at McBean Park in Lincoln. Email Katy at [entertainangels@surewest.net](mailto:entertainangels@surewest.net) to sign up to volunteer. This is a very important event for our club and we all need to work to make it a success. We will have much more information as we get closer to the date.

### Public Information Activities

The usual postings and submissions have been made. The Editor is pleased to announce that he has been appointed Section Public Information Coordinator for the Sacramento Section of ARRL.

### Weekly Net Activity

The net meets on the club repeaters on Tuesdays at 7:30 PM. The activity report since the last newsletter shows the following number of check-ins:

Date	Members	Visitors
Mar 5	30	8
Mar 12	30	4
Mar 19	33	6
Mar 26	29	5
April 2	32	6
April 9	32	3
April 16	34	6
April 23	32	11
April 30	30	7
April Em Comm Net = 21		

#### 10 Meter Net

An informal net often meets on 10m (28.475) immediately after the close of the regular net. This is a very interesting net and perfect for Tech's to get valuable experience working HF SSB. Please participate.

The Lodi club is running a 10-meter net after their regular Wednesday night 2-meter net. The 10-meter net is next on 28.400, USB, Vertical polarization. This means you can find a 10-meter net on Monday (TCARES out of Groveland), Tuesday (ACARC), and Wednesday (LARC). The Santa Clara club hosts a 10 meter net on Thursdays at 8PM on 28.385 USB.

#### 6 Meter Net

The Lodi club is running a 6-meter net following their 10-meter net on 50.135 USB Vertical polarization. They are also getting very active on ATV, for those interested in that aspect of the

hobby. The Stockton/Delta club has an unofficial get together on Thursday evenings (except meeting nights) at 7:30pm on 28.457.

The Sacramento Section ARRL net has been discontinued.

#### OTHER LOCAL CLUB NETS

Calaveras ARS has their weekly net at 7:30pm, Monday, on 145.70 -, PL 100

Stockton-Delta has their weekly net at 8pm, Monday, on 147.165-, PL 107.2

The UC-Davis club has their weekly net at 12:30pm Mondays, on 145.450 -, PL 203.5

El Dorado County club has their weekly net at 8pm Tuesdays, on 147.825 -, PL 82.5

Berryessa Amateur Radio has its club net on Sunday at 7:30pm

Yolo ARES is Monday at 8PM; on 146.97, PL123.3

Yuba Sutter Radio Club has its club net on Monday at 8PM

Yuba Sutter AREA is on Tuesday at 7PM; on 146.085, PL127.3

### Testing Opportunities

Granite Bay VE sessions occur the first Saturday of the month. They are held at the Granite Bay Raley's at the corner of Auburn-Folsom Road and Douglas Boulevard at 8 AM to 10 AM, and walk-ins welcome. Contact Dave no6no@arrl.net

5/11/2013 El Dorado Hills  
Sponsor: Rubicon Trail Foundation  
Location: Oak Ridge High School  
Time: 9:00 AM (Walk-ins allowed)

5/18/2013 Charmichael  
Location: Carmichael Elks Lodge  
Time: 7:00 AM (Walk-ins allowed)

5/18/2013 Stockton  
Sponsor: Stockton ARRL VE Test Group  
Location: Fire Station #14, McNabb St. off Thorton Rd.  
Time: 10:00 AM (No Walk-ins)

03/17/2013| Placerville CA 95667-4102  
Sponsor: Eldorado Search & Rescue  
Location: Sheriff Dept Bldg -OES Office  
Time: 9:00 AM (Walk-ins allowed)

5/23/2013 El Dorado Hills  
Sponsor: Folsom ARRL VE's  
Location: Raley's Grocery Store-Community Event Room  
Time: 6:00 PM (Walk-ins allowed)

6/15/2013 Arnold  
Sponsor: Calaveras ARS, Inc.  
Location: TBD. To be announced

Time: 9:30 AM (Walk-ins allowed)

6/15/2013 Charmichael  
Location: Carmichael Elks Lodge  
Time: 7:00 AM (Walk-ins allowed)

6/15/2013 Stockton  
Sponsor: Stockton ARRL VE Test Group  
Location: Fire Station #14, McNabb St. off Thorton Rd.  
Time: 10:00 AM (No Walk-ins)

6/22/2013 Sonora  
Sponsor: TCARES  
Location: Sierra Outdoor School - Field Day Site  
Time: 10:00 AM (Walk-ins allowed)

## Recent Articles of Interest -

### ARRL Web Site –

#### **Radio Before Radio, by Bradshaw Lupton Jr, K1TE**

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*A 1910 book about wireless telephone provides a fascinating look into radio's early history.*

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Early on a steamy Sunday morning in August my eagle-eyed spouse, Paula, N1EOG, spotted a yellow pamphlet titled *The Wireless Telephone* sitting on a dealer's dollar table at the Grafton, Massachusetts flea market. I was trying to be good and not spend the buck, but the cover drew me in. I fanned through the pages amazed at the simplicity in the ancient diagrams. This 1910 book detailed the birth of the "wireless telephone," with the 25 year old author, Hugo Gernsback, predicting the widespread proliferation of battery powered radiotelephones by 1920. Gernsback was based in New York City where he wrote, edited and otherwise documented the experiments of the early 20<sup>th</sup> century. He corresponded with the European radio experts and imported both the knowledge and the parts for the most exciting technologies of the early 1900s. He was a brilliant entrepreneur of what would become radio technology at a time before ham radio existed.

The first illustration in the book captured my imagination. Even though the radiotelephone it showed was just inductive and only transmitted 50 feet, I thought it was awesome that the receiver and transmitter combined used only eight parts. In keeping with this simple design there followed instructions for a wooden lathing and 5 foot coil "antenna". While the method worked through 50 feet of wood, walls and stone, Gernsback noted "the coils must be aligned facing each other as it works poorly otherwise."

If 50 feet wasn't DX enough for you, instructions followed for an earthen "closed circuit" telephone with only three parts. It consisted of a pair of metal plates buried in the ground to which a modulated current was applied. These parts were available right there at the Grafton market in the form of an old telephone and a bunch of batteries. From these you could assemble

a *working wireless telephone*! Gernsback used buried plates of zinc and copper, with an electrolyte of zinc chloride solution around each. He reached an amazing distance of 3 miles with the two plates 300 yards apart.

I have to admit, that while the cover hooked me, the *working spark gap radiotelephone* using only five parts was nearly incomprehensible. I thought of the cell phone in my pocket with its umpteen million transistors and a \$70 per month data plan.

The pamphlet further described the first Audion tube, with its filament, grid and “wing” (plate). He talked about how the early tube systems started out very sensitive, but rapidly deteriorated. One probably had to mail away (to Gernsback) for replacement parts unless one could build and evacuate a tube in the basement. Included was a schematic of a radiotelephone receiver. I noted that the diagram has the high voltage battery across the headphones — very, very scary.

Ever the businessman, Hugo Gernsback provided catalogs, parts and technology out of his Electro Importing Company (see Figure 10) in New York City. Gernsback was the visionary entrepreneur, experimenter, editor and thinker. I bought the book for a buck based on its cover, then fell in love with this fascinating look at radio’s first baby steps.

The back cover advertises his May 1909 *Modern Electrics* publication with the feature story “Signaling to Mars.” Now that’s one I want to read! If you have it or spot it, please drop me a line. My spouse and I will continue to comb the Grafton flea market for more inexpensive and exciting published treasures.

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***Eds. Note: Bradshaw has republished the 1910 public domain book The Wireless Telephone by Hugo Gernsback. It is available as an eBook for Kindle, Nook and iPad and also in hard copy from Amazon.com. Bradshaw can be reached via k1te@arrrl.net.***

## **From the pages of QST – April and May Issues**

The big news in the April issue was coverage of the 75<sup>th</sup> Anniversary of W1AW, the flagship station of ARRL. There were several pages of pictures and an opportunity to purchase a “W1AW Challenge Coin. There was also an article that could be of interest to all use use an AC generator as a power source for their radio equipment. Jerry, WB8IOW wrote about an updated circuit to protect against over-voltage by the generator. With full discussion, schematic, parts list, and pictures, he offers a complete approach to producing the circuit.

The May issue provided several good articles, of which three will be mentioned. For those working 2 Meters with QRP level outputs, and need a bit of a boost at times, James, W6PQL has plans and description for building a 80W amplifier. While it may not be for the rank beginner, it is certainly something to look at and, with the help of an elmer (we all need one), it can be a rewarding learning experience.

If you have thought conducting a DXpedition is out of your league, you should read the article by Padraig, KC9UUS about his trip to Cyprus. He organized it and, while learning a lot, was

successful in operating in the Greek portion of Cyprus, from several locations, for a week. It is a very interesting story. Oh, did I mention he is 15 years old, hold an Extra class license, and President of his high school radio club.

Lastly, if you have ever had a problem separating lengths of aluminium tubing sections, try Bob, W7VN's tip: "First I use a screwdriver to lift, very gently, the segments of the slotted end. I dribble a little rubbing alcohol over it 3 or 4 times over a minute or so. After the alcohol has settled in, I use two pliers to separate the two pieces. I find that the alcohol has penetrated to the end of the joint, softening the corrosion, after which I can wipe off the residue before it dries."

## **From the pages of CQ – March, April and May Issues**

The March issue had an article on using a variety of items to allow a site restricted operator (think CC&Rs) to operate without drawing undue attention to the fact. Allen, KC7O talks about using Christmas tree lights or a random length of wire connected to a dummy load to create a "dummy load dipole". Two pounds, 12 volts, 14 amp hours" is an item about a new battery that allows generous amounts of time on a rechargeable battery with relatively little weight. This can be a consideration if one has to be truly portable (as in backpack portability). The potential drawback is the price; but if weight is a factor its something to consider.

"Learning Morse Code" gives another way to think about how we learn Morse Code. The trick is to hear the sounds as "words" rather than as characters. Mike, WB4ZKA gives this concept a lot of thought and has several suggestions for additional sources of information. This is something for those of us who would like to learn code to consider.

In April, there was an article on choosing a radio, or radios. This is a good article for new licensees and a refresher for some of who have been licensed longer. The information is contained in the Learning Curve column of Ron, KO0Z. For those interested in digital stuff, Don, N2IRZ writes in his column about digital amateur television. He covers some of the basics and goes into detail about "off the shelf" as well as construction projects.

May brought an article on using LED's. For those who have not worked with these tools, this article gives an excellent primer on their use, how to determine what values are needed for projects, and a simple LED AC circuit. For those interested in kit building, the column by that name talks about a "novel, new CW transceiver Kit". It is a 40M radio, newly developed/produced using an Arduino as its controller and serving several useful functions. And finally, for those interested in Emergency Communications/ARES, the Public Service column is a "must read". With pictures and discussion, they talk about the work of the Brevard (FL) Emergency Amateur Radio Services. Their mobile comm center is a wonder.

## **ARRL Letter –**

### **Annual Armed Forces Day Crossband Test Scheduled for May 11**

In celebration of the 63rd anniversary of Armed Forces Day (AFD), the Army, Air Force, Navy, Marine Corps and Coast Guard are co-sponsoring the annual Military/Amateur Radio Crossband

Communications Test. Although Armed Forces Day is traditionally celebrated on the third Saturday in May -- May 18 in 2013 -- the AFD Military/Amateur Crossband Communications Test will be conducted on May 11 to prevent conflict with the Dayton Hamvention<sup>®</sup>, scheduled for May 17-19. The annual celebration features traditional military-to-amateur crossband communications SSB voice and Morse code tests. These tests give Amateur Radio operators and short wave listeners an opportunity to demonstrate their individual technical skills and to receive recognition from the appropriate military radio station for their proven expertise. QSL cards will be provided to stations making contact with the military stations.

### ***Florida Man Cited for Causing Harmful Interference to Radio Amateurs***

The FCC has issued a *Citation and Order* to Ruben D. Lopez Jr of Pomona Park, Florida. The *Citation*, issued April 23, is in response to several complaints about a well pump at Lopez's residence that was acting as an incidental radiator and causing harmful interference to local radio amateurs.

In July 2010 and February 2011, the FCC received complaints from radio amateurs regarding interference on the MF and HF Amateur Radio bands. Upon investigation, the FCC found that a well pump at Lopez's residence was causing the interference, and advised Lopez of the complaints and of the rules regarding interference to licensed radio services. The FCC instructed Lopez to resolve any interference. According to the *Citation*, in October 2012 -- in response to another interference complaint -- FCC agents "used direction finding equipment to identify Mr Lopez's well pump as the source of transmissions on the frequency 1800 kHz. The agents...confirmed that Mr Lopez's well pump was the source of the interference by conducting on/off tests -- the interference ceased when the well pump was turned off. The agents informed Mr Lopez that he must cease operating his well pump until the interference could be resolved. After the October 23, 2012 inspection, the [FCC's] Tampa Office received information that Mr Lopez tried to eliminate the interference by replacing the A/C line filter for the well pump, but the new filter did not resolve the interference."

Lopez was found by the FCC to be in violation Section 15.5(b) and (c) of the FCC's rules by operating an incidental radiator and causing harmful interference. He was instructed by the FCC to "take immediate steps to ensure that he does not continue to cause harmful interference, including repairing or replacing his well pump and associated control circuitry."

## **ARES E-Letter –**

### ***EasyPal Does More Than SSTV***

A few years ago, I took the ARRL emergency communications course, and that was the first time I had ever considered that digital modes have a significant role to play during an emergency. Many types of communication modes are better suited for relaying a list or spreadsheet than voice transmission. Lists of names and addresses, medical supplies, and sets of detailed instructions are examples. Also, some agencies have their own forms that they may want used and sent. I began to envision an agency official handing me a USB memory stick and asking me

to transmit the Word document that was on it. I began to search for possible software that could meet these requirements for our DuPage County ARES, Illinois group.

### *EasyPal* Does It

Vern Schultz, K9LAE, told me about *EasyPal*. It was being used by many operators for SSTV, but what it really does is send files. It sends jpg, txt, doc, xls, and pdf files, just to mention a few. This sounded like a great fit for our ARES requirements, so Vern and I began to run *EasyPal* through its paces to see what we could do with it.

Our first test was to send a jpg file. We found we could send any size jpg file in about 2 minutes with SVGA quality. *EasyPal* automatically reduces the file size to something sensible before sending it. For example, I loaded a 1.16MB picture into *EasyPal*. The program reduced it to a 27k jpg file and transmitted it in 121 seconds. This meant we could take a picture of a situation in the field with a smartphone or a digital camera, load it into a laptop, and transmit it in 121 seconds to our base of operations. This would certainly fill one of our requirements.

Next we wanted to try sending a document saved in the txt format. I copied a weather bulletin from the National Weather Service and saved it as a text file. *EasyPal* transmitted the 1.85KB file in 23 seconds. This represented another requirement we could check off as being met.

A Microsoft Word document (doc file) was next. I created a one-page document with boldface, italics, underlining, indented bullets, and different sized and colored fonts. *EasyPal* sent the 16.7KB file in 102 seconds - complete with the original formatting. No need to rearrange the text to resemble the original document.

If it worked this well for a doc file, what would it do with an xls spreadsheet? To find out, I created a spreadsheet with a list of Shelter Numbers and types of supplies. It was an inventory of available supplies and their locations. The totals for each type of supply appeared at the bottom of each column. *EasyPal* sent this 16.5KB spreadsheet in 97 seconds, and not only was the spreadsheet formatted exactly like the original (same column widths, same color fonts, same boldface formatting), but the arithmetic calculations still worked!

We continued our testing with a pdf file of our local Severe Weather Liaison Repeater Template. It's a 13.7 KB multi-color diagram including various shapes, colors, and text. *EasyPal* sent the file in 87 seconds with every bit of received information an exact duplicate of the original file.

*EasyPal* also has several standard forms built into the program. There's a blank free-form screen for entering text. This could be used for strategic conversations between *EasyPal*-enabled field units. There's also a form resembling an ARRL Radiogram, an ICS-213 form, an ICS-213 (ARES Version), an ICS-213-1 (a more casual version of an ICS-213 form), and a MARS form. They all have proper formatting and blanks, which can be filled in at the sending station and printed at the receiving station. Any of these forms can be sent in under 30 seconds. A version of *EasyPal* that is currently under test includes a Chat function with a free-form text message, which also indicates the call sign of the station sending the message. All sent and received messages are automatically stored in *EasyPal* folders for retrieval if needed later.

And, if one of the *EasyPal* stations has access to the Internet, any of the field stations can send and receive email - with attachments - through that station (called an *EasyPal* Repeater). What a great bonus feature this is.

*EasyPal* is a digital soundcard program that interfaces directly with your PC or laptop. It's a single program that uses the DRM ([Digital Radio Mondiale](#)) modulation format. It will work on HF, VHF, and UHF, and we have used it successfully through local VHF and UHF repeaters. The program uses interleaved Reed-Solomon Forward Error Correction. We chose to use the SignalLink external soundcard because it's easier to adjust levels and delay.

## Conclusions

*EasyPal* is easy to use - and it's free. The author, Erik Sundstrup, VK4AES, has been very responsive to our inquiries and requests. We are thankful for his interest and support. There are several sources of information on the Internet with instructions for using *EasyPal*, but some of the information is for earlier versions of the software. We wound up writing our own *EasyPal* User's Guide for our ARES group, which can be downloaded from <http://dupageares.org/memberresources.html> (click on *EasyPal* User's Guide). We conducted a Saturday morning workshop to train ARES members from four counties, and we now use *EasyPal* to send a practice ICS-213 (ARES Version) message on alternate dates for our EmComm net. Soon we will be conducting an all-digital monthly *EasyPal* net. The latest version of the *EasyPal* software is always available for download from [www.vk3evl.com](http://www.vk3evl.com).

If you're looking for a single software tool that will send your served agency's files, take a look at *EasyPal*. It exceeded our expectations in being able to send messages quickly, in a wide variety of formats. - *Ed Worst, K9EW, Westmont, Illinois, [www.k9ew.us](http://www.k9ew.us)*

## Special Events

***Field Day: June 22-23, set up June 21<sup>st</sup>. Location to be announced***

## Guest Columns –

***Microcontrollers -- Small But Mighty, By Stan Horzepa, WA1LOU***

Microcontrollers are gaining a foothold in the ham radio world. Here are some resources to help begin your explorations.

I've added a new book to my library: *Ham Radio for Arduino and PICAXE*, edited by Leigh L. Klotz Jr, WA5ZNU.

No, Arduino is not a new entity on the DXCC list, but rather a single-board microcontroller, that according to the Arduino website, provides “an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, hobbyists, and anyone interested in creating interactive objects or environments.”

Similarly, PICAXE is a microcontroller that is “designed to be the brain of your electronic project.” According to the PICAXE website, the PICAXE system was “[o]riginally designed as an educational system for schools, [but] has now also been widely adopted by hundreds of thousands of ‘hobbyists’ due to its ease of use.”

WA5ZNU’s book is full of ham radio applications based on Arduino and PICAXE. Visit the book’s companion website for a list of the projects and other pertinent information. By searching Google, you will find hundreds of entries on Arduino and PICAXE applications in Amateur Radio. For example, one of my favorite websites, Hack A Day, recounts Todd Harrison’s recent attempt to build an Arduino frequency counter for a Kenwood TS-520S transceiver.

Speaking of ham radio project development platforms, there also is HamStack, a website I have mentioned before. HamStack concentrates on ham radio projects and is a presence in the ham radio maker community.

**Upcoming Events** – See Testing Opportunities for tests in Calaveras and Tuolumne counties.

**Odds and Ends** – None this month

## **Fun Zone**

This section is designed to give a little fun, humor, education, or all of the above. This month we are pleased to have Ward Silver back with one of his educational and entertaining quizzes; this time in Jeopardy format. Good Luck!

### ***Amateur Radio Quiz: Your Days Are Numbered, by H. Ward Silver, N0AX***

Worse than the dreaded “word problem,” this April quiz is full of backward problems where I give the answer and you pick the problem. Or something like that. You’ll figure it out!

1) 9

- a. The dB equivalent of a power ratio of 4.
- b. The number of wavelengths traveled by a 7 MHz signal in 1.29  $\mu$ s.
- c. Value of SWR if a 337.5  $\Omega$  load is connected to 75  $\Omega$  coaxial cable.
- d. Maximum number of ARRL Directors that can fit into W1AW Studio 1 at one time.

2) 622

- a. Characteristic impedance of open-wire line with a conductor spacing of 0.5 inches.
- b. Maximum number of multipliers for a DX station in the ARRL International DX Contest.
- c. Peak-to-peak value of a 220 V RMS ac waveform.
- d. Current cost of a genuine Eimac 3-500Z triode in the original shipping carton.

3)  $2\pi/360$

- a. Conversion factor from degrees to radians.

- b. Conversion factor from angular velocity to frequency.
  - c. Conversion factor between secants and tangents.
  - d. Conversion factor between hertz and cycles per second.
- 4) 470 pF
- a. Value of capacitance required to resonate with a 3.9  $\mu$ H inductor at 3.72 MHz.
  - b. Value of capacitance which creates 338  $\Omega$  of reactance at 28 MHz.
  - c. Value of capacitance exhibited by a one foot length of RG-174 coax.
  - d. Value of capacitance consumed by over-rotating three-phase del stator.
- 5)  $134 \pm 1$  percent
- a. Brown, red, green, pink
  - b. Black, orange, yellow, silver
  - c. Brown, orange, yellow, black, brown
  - d. Black, R, green dot, J, stripe
- 6) 225
- a. Voltage transformation ratio of a transformer with a turns ratio of 15.
  - b. Impedance transformation ratio of a transformer with a turns ratio of 5.
  - c. Impedance transformation ratio of a transformer with a turns ratio of 15.
  - d. Number of ferrite beads required to suppress RFI from a 160 meter signal.
- 7) 400
- a. Loaded Q of a 10 MHz tuned circuit with a bandwidth of 250 kHz.
  - b. Loaded Q of a 1 MHz tuned circuit with a bandwidth of 25 kHz.
  - c. Loaded Q of a 10 MHz tuned circuit with a bandwidth of 25 kHz.
  - d. Loaded Q of a Field Day operator if coffee is made too strong.
- 8) 3
- a. Length in feet of a 28 MHz 1/4-wave stub of coax with a velocity factor of 0.66.
  - b. SWR for a reflection coefficient of 0.5.
  - c. Impedance transformation ratio of a 1/4-wavelength sleeve balun.
  - d. Number of times to attempt adjustment of a gamma match before calling it “close enough.”
- 9) 4.6
- a. Optimum length of ground radials in electrical degrees at HF.
  - b. Approximate length in feet of a 1/4-wave ground plane antenna resonant at 50.125 MHz.
  - c. Approximate length in cm of a 1/2-wave dipole antenna resonant at 222.1 MHz.
  - d. Apparent weight in kilograms of a hamfest-purchased rotator after being carried all the way back to the car.
- 10) 30
- a. Five time constants for a 100 k $\Omega$  bleeder resistor connected across a 60  $\mu$ F power supply capacitor.
  - b. The time constant of a 1 M $\Omega$  bleeder resistor connected across a 6000  $\mu$ F power supply capacitor.
  - c. Peak inverse voltage across a diode in a full-wave bridge rectifier connected to a 6 V RMS

secondary.

d. Average number of milliseconds to wait before calling CQ after asking if frequency is in use.

**Bonus Question:** 90

Answers:

1. b
2. c
3. a
4. a
5. c
6. c
7. c
8. b
9. b
10. a

**Bonus Answer:** Edition number of the 2013 *ARRL Handbook*. All of the information necessary to figure out all of these problems is available in any recent edition!

**Eds Note:** This is a combined edition because of extenuating circumstances. I went to see my tax man in April. He gave me the results and I waited for him to say “April Fool”. He didn’t. I went into shock, looked for a country that did not have an extradition treaty with the IRS, and finding none, I entered a trance from which I only recently returned. Hence the loss of April. **(Disclaimer: Only part of this is made up) ☺**

73, John Stettler, Newsletter Editor  
Send comments to: [ki6dwp@vahoo.com](mailto:ki6dwp@vahoo.com)  
Editors who reciprocate are appreciated

