

M A R C H 2 0 0 9

# SCOPE

A newsletter by and for the Palomar Amateur Radio Club of San Diego, California.  
See SCOPE in color on our website at [www.palomararc.org](http://www.palomararc.org).



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## Lunch Bunch Helps Preston W6ASP Celebrate Birthday

A large Lunch Bunch crowd at Fuddruckers on 30 January 2009 helped Preston Butler W6ASP celebrate his 60<sup>th</sup> birthday. The multi-layer multi-flavor cake with chocolate icing and blue lettering was cut by Ted KD6AKT, who also collected donations for an HRO gift certificate for Preston.

The lunch bunch meets every Friday and is easy to join.  
See [www.w0ni.com](http://www.w0ni.com) to sign up for the mailing list.

### Save the Date!

#### Club Meeting

**4 March 2009**

Emergency  
Communications  
Update with Terry  
Runyon K3PXX

#### Board Meeting

**11 March 2009**

7:00pm at W6GNI  
QTH.

#### Tech Class

**21 March 2009**

8:00am – 5:00pm  
Please RSVP with  
Steve Early at  
[ad6vi@cox.net](mailto:ad6vi@cox.net).



## Club Reports

**Got news? Send reports about your activities and things that you think other club members need to know to [scope@palomararc.org](mailto:scope@palomararc.org).**

### February Raffle Winner

Winner of the YAESU FT51R 2m/70cm dual receive hand held transceiver at the February 2009 General Meeting is Donna Zaitz, KI6SBW. She is a new ham, who now has a radio to get on the air. It only took one ticket to win.

Dennis KD6TUJ

### December Fold and Staple

KB6NMK Jo, WA5ACE Sonny, W6GNI Al & Kathy, KB6YHZ Art

The last Fold & Staple for 2008!

### Membership Report for Dec. 2008

New Members Joining PARC: KI6SAO, KI6UYF, N6IMM, and KI6TUA. One member reinstated his membership, which had lapsed. Thanks to all.

At the last Board Meeting, the Treasurer Reported a summary of 2008's Expenses and Income. In order to support the repeaters on the mountain, the following were the expenses for the year. Property tax \$244.30, Electricity \$1475.03, Telephone line charges \$856.36, Misc. repairs \$613.11. That adds up to about \$3188, or about \$266 per month. In addition, the tower was repainted, for the first time since installation for preservation. (\$3546.26)

The funds to support all this come from member dues, and donations.

We need new members! And equally important, a greater percentage of renewals!







Pictured at left (photos by KB5MU) is Harry W6YOO. He presented "In the Wake of the HMS Bounty" at the February 2009 PARC general meeting.



After the February Board meeting at the home of our secretary Loren, AD6ZJ, we were privileged to tour his ham shack, shown here. It's traditional to call our radio room "the shack", but Loren's really is a shack in the back yard. He told us about the day when just decided to tear down the old shack and build a better one. By the end of the day he'd moved out all the gear and demolished the old

shack. He called for a work party to pour the new concrete slab, and Conrad KG6JEI showed up to help. About six weeks later, this neat new shack was completed and on the air. Loren assures us that the test equipment all works, but some of the vintage gear is, shall we say, an ongoing project. —KB5MU

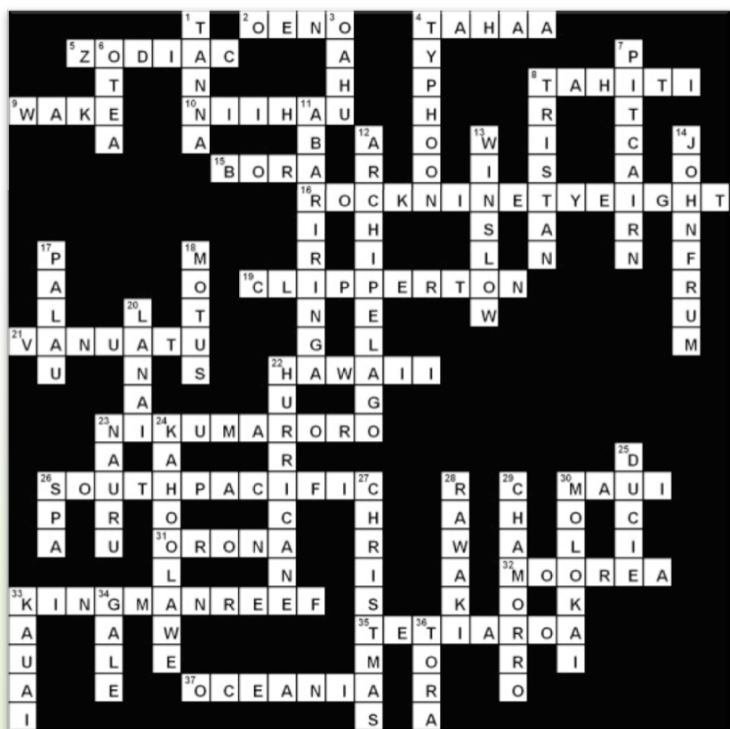


## February Puzzle Solved

### And Now, The Riddle of the Elmer

It's said that a famous Elmer had among his treasures an enclosure, the top of which was perfectly square in shape. It was inlaid with pieces of copper, and a strip of gold ten inches long by a quarter of an inch wide. The Elmer promised to teach all his ham radio knowledge to the one who would tell him the dimensions of the top of the box from these facts alone: that there was a rectangular strip of gold, ten inches by 1/4-inch; and the rest of the surface was exactly inlaid with pieces of copper, each piece being a perfect square, and no two pieces of the same size.

Can you solve the Riddle of the Elmer?



# San Diego CERT Spring Exercise Prelim Report

## CERT, ICS, and Drills

The San Diego CERT Spring Exercise was designed in major part by David Heiser KI6SAO to provide hams and Community Emergency Response Teams (CERT) a way to practice the Incident Command Structure (ICS) system, which is a standardized management protocol for emergencies. All emergency workers and citizens are encouraged to learn and practice ICS. Drills and exercises are opportunities for just such endeavors.



## Drills Don't Have to Be Dull!

The Spectators sure weren't dull. See photo at left. When the Palomar Mountain community learned that it had been selected as the final leg of the 2009 AMGEN Tour of California bicycle race, preparations began to safely accommodate the expected crowds. Estimates for crowd size ranged upwards of 10,000 people. Managing large crowds requires excellent communications support.

## Types of Hazards Expected

In the photograph to the right, taken on Sunday morning at the summit of Palomar Mountain, four types of traffic can be seen: foot, bicycle, car, and motorcycle. Different types of traffic mixing together in a high-distraction environment means increased risk of accidents. Good communications mitigate the risk.



Photos by  
W5NYV



## Fun and Fellowship

It goes without saying that working an internationally recognized sporting event in a beautiful outdoor environment with full and friendly support from the served agency has all the ingredients for a very enjoyable experience. The San Diego CERT Spring Exercise in support of the AMGEN race certainly was all that and more. More on the event in April Scope!



## CW Skimmer

### SDR Concepts In Action

*By Paul KB5MU*

Old meets new. What's the oldest thing in ham radio? Morse code, of course. After all these years we still key our transmitters on and off to communicate, and use our radio receivers, ears, and brains to turn those bursts of energy back into understandable information. What's the latest hot technology in ham radio? Probably software-defined radio (SDR), which uses computing power in place of expensive, finicky radio hardware to achieve superb performance at lower cost. These two technologies merge in a new program from VE3NEA called CW Skimmer.

Let's start with a review of what it's like to receive CW the traditional way. Pick a band segment, say the 40-meter CW segment from 7.000 MHz to 7.125 MHz, and switch the radio receiver (or transceiver) to that band. This segment is 125 kHz wide, which is plenty of room for hundreds of different CW signals, each on a slightly different frequency. Human hearing is more limited, so our traditional radio receiver filters out most of the signals. With a typical SSB filter, only about 2.4 kHz section of the band is audible at any one time. That's still enough room for dozens of different CW signals. Our receivers translate radio frequencies into audio frequencies in such a way that each CW signal on a different frequency comes out as an audible tone with a different pitch. The receiver's tuning knob controls which 2.4-kHz chunk of the band we're listening to, and all the signals in that chunk come out of the receiver at once. The operator has to concentrate on the audible tone at one particular pitch, ignoring all the others. The loudness of the tone corresponds directly to the strength of the

received signal. Since the transmitting station is switching the signal on (full strength) and off (zero strength), the receiving operator will hear the tone switch on and off, and is able to decode the long and short bursts of tone into characters, words, and eventually an entire conversation.

What's wrong with this picture? There are potentially hundreds of signals in that one band segment, and by intense concentration (unless you're better at receiving Morse code than most operators!) you can copy at most one of them at a time. What's worse? You usually don't know which signal to concentrate on until after you've already copied it. You have to tune around, listening briefly to signal after signal, concentrating enough to get the gist of what's being said, until you find a station that you want to work. That can be very enjoyable, and a skilled CW operator can do it with remarkable efficiency, but it's still time-consuming and can become tedious. Even the best CW operator can only copy a tiny fraction of the activity on a busy band.

CW Skimmer can do a whole lot more. It's a Windows program that can automatically and simultaneously decode all the CW signals in a band segment. On a fast computer (3 GHz P4) it can decode up to 700 signals. That's remarkable enough in itself, but that's only the beginning of the feature list. CW Skimmer is designed to help you visualize all the activity on the band and pick out signals of special interest.

The main window features a graphical display called a waterfall. You may have seen waterfall displays used in digital mode programs such as Digipan for PSK31. In a waterfall display, one axis is frequency and the other axis is time. The time axis scrolls by continuously, so you're always looking at the last few seconds of time.

*continued on page 8*



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Please check our complete ads in **QST**, **CQ**, and **World Radio** magazines.

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#### (12.26) FOR SALE

Ten Tec Omni V transceiver. \$400. Astron 35 amp power supply. Model RS35M, \$100. Ten Tec antenna tuner. Rated 2kw, model 229, \$90. Inverted V antenna for 80/40, \$20. Heathkit 3inch scope model IO-21, \$20. HAL DXP38 RTTY modem, \$200. Hy-Gain Hy Tower 5 band vertical, \$300. Transistor 3inch RTTT scope. Takes input from radio, \$40. call for details on all items for sale to . Dale, W6IWO 760-728-6800 location is Fallbrook, CA

### Special Event

During the month of February PARC celebrated its 73rd anniversary. As part of the celebration several members were issued special 1x1 call signs. Each of 4 1x1 calls was used in the four consecutive weeks during the month. By working all four stations you were able to spell PARC with the suffixes. These stations were active on the repeaters as well as HF and VHF simplex but each call was only on for one week. There will be a special QSL card for stations that worked all four and spelled PARC.

73  
AD6ZJ, Loren

## Club Classified Advertisements

Commercial ads are \$2 per column inch per month. We will adjust your ad copy to conform to the number of inches bought.

(1.25) For Sale: Two CDR heavy duty rotators with control heads.

E mail at [sstires@cox.net](mailto:sstires@cox.net).

Sonny, WA5ACE

### PARC Anniversary – Call for Volunteer

The Palomar Amateur Radio Club began in February 13, 1936 as North San Diego Radio Club. The name changed to Palomar Radio Club prior to the June 1936 publishing of QST. Association with ARRL began on May 8, 1937. February 2009 marks our 73<sup>rd</sup> anniversary. Two more years will be our 75<sup>th</sup> and we would like to do something very special.

First, we would like a volunteer to lead the 75<sup>th</sup> anniversary organizational effort. We would like to see events throughout the year take advantage of our anniversary theme.

Second, we would like to hear from all of you that may have any stories, memorabilia, documents, photographs, and other items that could be presented and shared at our 75<sup>th</sup> anniversary events.

Please contact [board@palomararc.org](mailto:board@palomararc.org) or any officer at a meeting to help with making our 75<sup>th</sup> anniversary year special.

Thank you for your participation and support.

Dennis KD6TUJ and Michelle W5NYV



*continued from page 5*

Within the waterfall, the brightness of the display indicates signal strength. An empty band would be all black. Strong signals show up as bright blue against the black background. Weaker signals are dimmer. The speed and resolution of CW Skimmer's waterfall are designed so you can easily see the dots and dashes of each Morse code signal, so you can identify which audible signal corresponds to which line of bright blue dots and dashes on the waterfall display. See page 10 for a picture.

CW Skimmer is also looking at those dots and dashes and continuously decoding every single one of them and storing the results. It scans the decoded information for callsigns and tags each line on the waterfall with the decoded callsign from that station. You can see at a glance what stations are being heard throughout the band. CW Skimmer also has some understanding of the typical ham radio QSO, and can identify which stations are calling CQ, which stations are giving signal reports, and which stations just came up on a new frequency and asked, "QRL?"

With the mouse you can select any signal you see on the waterfall or in the station list. CW Skimmer then becomes a radio receiver (with noise blanker, AGC, and a sharp variable-bandwidth filter you can control) and lets you hear that specific station live on the air. There's no need to wait and see what the station is sending, though, because CW Skimmer also displays all the text it has received from that station, so you immediately see exactly what that station has been up to. You get a single line display at the bottom of the window, or you can pop up a window to see more of the received text.

Aside from just being incredibly cool, this is

quite useful in a couple of situations. It's ideal for a pileup, where many stations are calling a single station in an exotic DX location, and you also wish to work that station. With CW Skimmer, you can instantly visualize the pileup. If the program is able to receive the station that the DX station is currently working, you'll quickly pick out his callsign from the station list display. CW Skimmer helps with this by highlighting the signal report he will be sending to the DX station. In this way you can figure out where the DX station is likely to be listening, and be on that frequency yourself. CW Skimmer will even take care of tuning your transceiver to the selected frequency.

CW Skimmer is also great for contests. You can skip all the tuning around and looking for new stations to work. Just look at the screen and you can see where they are. Click and you're on their frequency. No sweat. It's so easy and powerful that the release of CW Skimmer has touched off a storm of controversy in the contesting community. It's almost like having a room full of second operators, all diligently tuning around on your behalf. Contest rules prohibit that kind of extra help, or put such team operations in a separate class, but currently the rules don't say anything about a computer program like CW Skimmer. This isn't the first time innovations have changed the playing field for testers. Some contests will probably make changes to the rules. In other contests, it might well turn out that CW Skimmer or something like it will become just another part of a well-equipped competitive station.

If you've ever played with a computer program that receives Morse code, you may be skeptical. Computers are not as good as skilled human

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operators at decoding Morse code. That is still true with CW Skimmer, but it does a remarkably good job. It certainly helps that nowadays a lot of the code you hear on the bands is sent by a machine and not with a hand key. Virtually everybody in a contest will be using a computer and sending very predictable, perfect code. In that situation, CW Skimmer can copy very reliably indeed.

There are two ways to hook up CW Skimmer. The easiest thing to do is hook it up exactly like any other “sound card” program, like the ones you’d use for PSK31 or RTTY. That is, you use a regular SSB/CW transceiver and connect its audio output up to the computer’s sound card. This works fine, but it’s limited by the audio bandwidth of the transceiver, which is of course designed based on human speech and hearing. With this kind of hookup, CW Skimmer can only hear what you would hear, in that 2.4-kHz chunk of the band that’s within the transceiver’s filters. That’s enough to be useful, but wouldn’t it be nice if you could see the whole band segment?

You can, but you will need to get that narrow SSB filter out of the way. You can’t just turn off the filter, though. The circuits of the transceiver aren’t intended to pass signals in that way. Your transceiver is overkill for this kind of monitoring, anyway. The narrow filter and related performance characteristics are most of what you’re paying for in a ham radio transceiver. To simply sweep in wide swaths of the band, a much less complex circuit is sufficient. There are a number of low-priced SDR receivers on the market, and they all work fine with CW Skimmer. The SoftRock Lite II, for instance, is available as a kit for as little as \$10! That’s a single-band, receive-only receiver

that works with any SDR program, including CW Skimmer. It hooks up to an antenna on one end, and to your sound card on the other, no other hardware required.

On the other end of the cost spectrum, you could get a dedicated SDR transceiver like the FlexRadio Systems Flex-5000C single-box SDR with computer built-in, starting at about \$5000. That will get you some extra performance, of course, but the \$10 SoftRock is already pretty good, thanks to the digital signal processing algorithms used in the software. The SoftRock can even be operated using exactly the same software as the expensive Flex-5000, which turns it into a full-featured receiver with panoramic display.

An interesting third approach is to use a regular transceiver but connect a SoftRock or similar SDR-based radio to a wideband IF signal from inside the radio. Some transceivers have a wideband IF output on the back panel, but most will require modification to bring the IF signal out. This configuration lets the inexpensive SDR radio take advantage of the front-end filtering on your main transceiver, and it automatically follows your transceiver from band to band.

Except for fully-integrated SDR radios like the Flex, your computer’s sound card is an important part of the SDR system, whether for CW Skimmer or for general receiver applications. Its sampling rate will determine how large a band segment you can monitor at once. Built-in sound cards can generally sample at 48 kHz, which will give you almost 48 kHz of bandwidth, already twenty times the bandwidth of the SSB filtered audio from a transceiver. Higher-end sound cards can do 96 kHz or even 192 kHz, with proportional

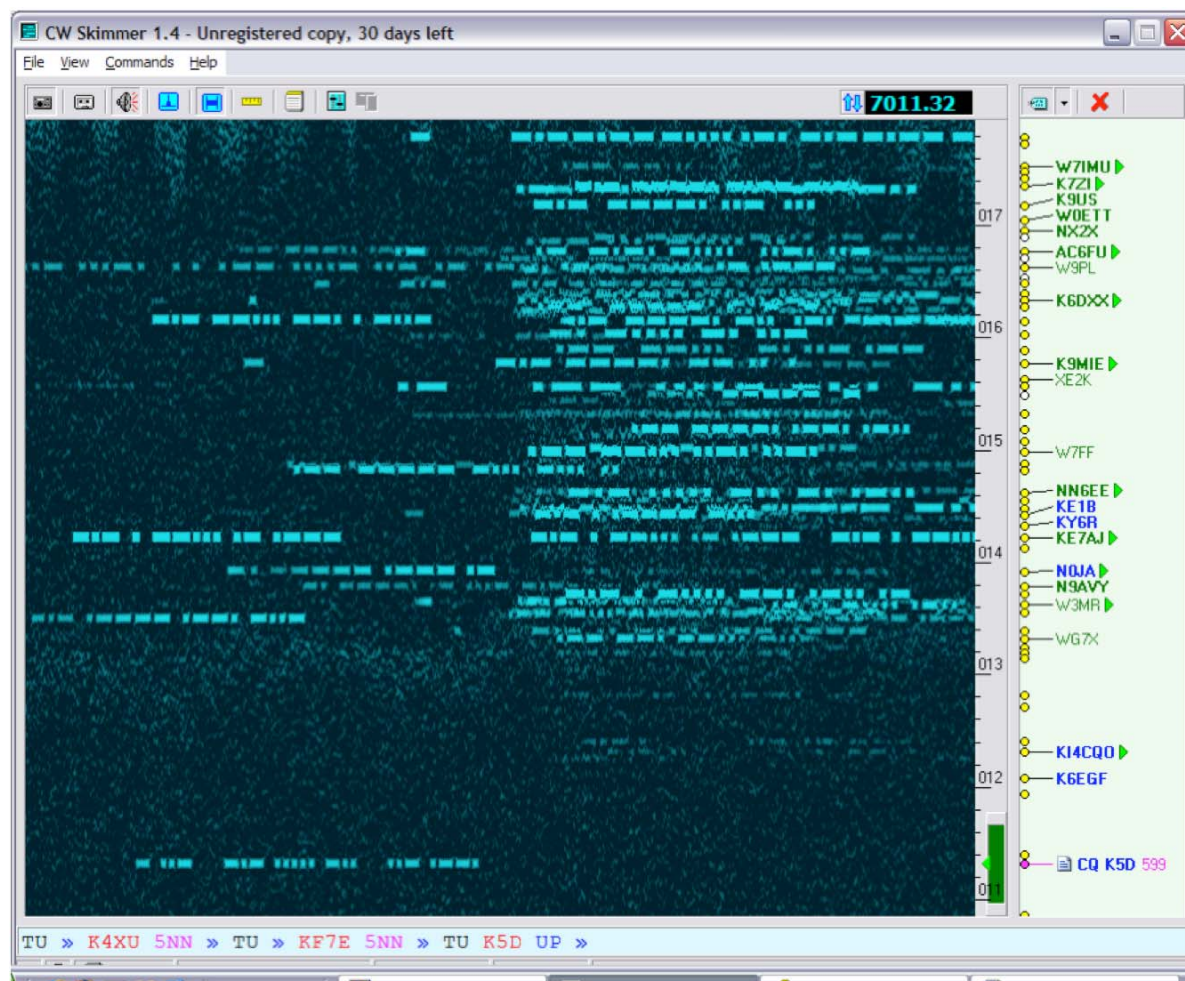
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increases in bandwidth. Other aspects of sound card performance are also important. Try it out with what you've got, but if you want to buy a better sound card for SDR use, the best bet is to search the web and find out what other people are using successfully.

Right now the E-MU 0202 external USB sound card (about \$130) is popular.

CW Skimmer costs \$75, but the author allows a 30-day trial period at no cost. That's plenty of time to play with it and get so addicted to the advantages of SDR that you start shopping for a new SDR-based transceiver! Don't say I didn't warn you.



Above is CW Skimmer monitoring the pileup on K5D on Desecheo Island on February 16 on the 40-meter band.

At the bottom you can see the DX station transmitting “TU K5D UP”, which means “thank you (previous station), this is K5D, listening for calls on frequencies above my frequency.” Then as soon as he finishes, you can see dozens of stations jump in and call him simultaneously. You can also see a few stations mistakenly calling on top of the DX station.

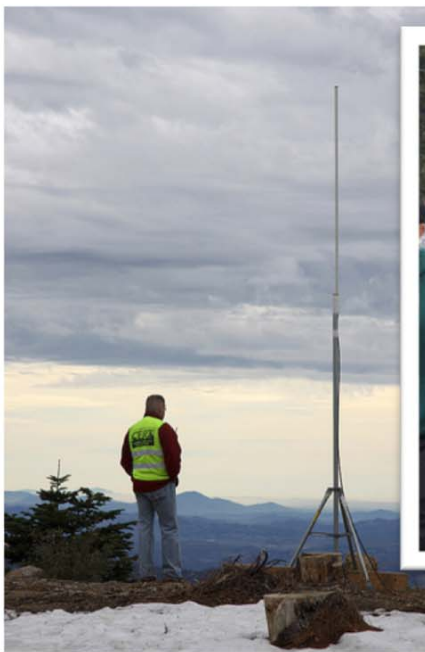




Jim Egerton W6SST  
Photos by W5NYV (left, center)  
and KB5MU (right)



## A Few CERT Spring Exercise Photos



Bill Leininger looks over South Grade above. Redlands bicycles comfort station with video feed above right. Summit populated by CHiPs, cyclists, and pedestrians awaiting the lead racers at right.  
Photos by W5NYV



## SCOPE

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Scope (USPS #076530) is published monthly by the Palomar Amateur Radio Club 1651 Mesa Verde Drive, Vista, CA 92084. POSTMASTER: Send address changes to SCOPE, P.O. Box 73, Vista, CA 92085. Periodicals postage paid at Vista, CA 92084. Dues are \$20 per year or \$35 per year for a family. Dues include a subscription to Scope.

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## Featured Program

Terry Runyon K3PXX will be doing the talk for the March meeting.

He will cover the role of different groups of Hams in emergencies. R.A.C.E.S., A.R.E.S., C.E.R.T. Salvation Army, and especially the Palomar Radio Club.