



# RF



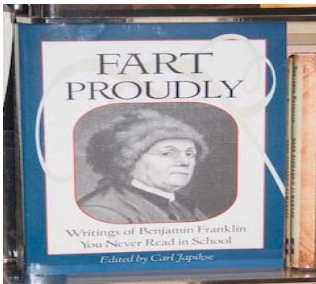
VOL. XLIX NO. 10 P.O. Box 3454, Tustin, CA 92781-3454

October 2008

## The PREZ Says:

Hello OCARC,

Time is going by quickly in New England. I expect to be walking through snow to get to work soon, ick. Cheryl and I have been touring around the area. Cheryl has never really been away from the west coast, and the sites and



sounds of the north east are bringing back many memories. Many of which are not fit for publication. I have included several photographs to offer as proof that I am not just sleeping in during the board meetings. This area is rich in history. Benjamin Franklin was born here and I included a picture an



example of his fine wisdom and common sense. Walking around the city of Boston reveals history and famous sites everywhere you look. Walking from a parking area to the Charleston Navy Yard has a small plaque showing where Paul Revere landed before his famous ride.

On one of the many rainy days, the cloud ceiling was so low that I was able to take this interesting shot. The tall clock tower building is the Customs House. This is where the FCC issued Amateur Radio tests during the late 1970's. As a bit of personal history, this is where I went to take my Tech Plus examination. There were no



study guides then, and I never had to crack a book in my life. Naturally I failed the first time. I had to go back a couple weeks later to retake the test, this time I scored 100%. We drove up to Maine and New Hampshire last weekend with my parents and



grandmother. I was able to find the perfect place to hold Field Day from New Hampshire. The Indian Head Motel & Resort sports a HUGE observation tower! See you there in June.

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**THE ORANGE  
COUNTY  
AMATEUR RADIO**



**Club Dues:**

Regular Members...\$20

Family Members\*...\$10

Teenage Members...\$10

Club Badge\*\*...\$3

Dues run from Jan. through Dec. & Are prorated for new members.

\* Additional members in a family of a regular member pay family rate up to \$30 per family

\*\* There is a \$1 charge for the badge being mailed to you.

**ORANGE COUNTY AMATEUR RADIO CLUB – W6ZE**

**2008 Board of Directors:**

**President:**

Willie Peloquin, N8WP  
(714) 318-4047  
[n8wp@w6ze.org](mailto:n8wp@w6ze.org)

**Vice President:**

Nicholas Haban, AF6CF  
(714) 693-9778  
[AF6CF@w6ze.org](mailto:AF6CF@w6ze.org)

**Secretary:**

Ken Konechy, W6HHC  
(714) 744-0217  
[W6HHC@w6ze.org](mailto:W6HHC@w6ze.org)

**Treasurer:**

Paul Gussow, W6GMU  
(714) 624-1717  
[W6GMU@w6ze.org](mailto:W6GMU@w6ze.org)

**Membership:**

Chris Winter, W6KFW  
(714) 543-6943  
[W6KFW@w6ze.org](mailto:W6KFW@w6ze.org)

**Activities:**

Kristin Dankert, K6PEQ  
(714) 544-9846  
[K6PEQ@w6ze.org](mailto:K6PEQ@w6ze.org)

**Publicity:**

Rich Helmick, KE6WWK  
(714) 343-4522  
[KE6WWK@arrl.net](mailto:KE6WWK@arrl.net)

**Technical:**

Bob Eckweiler, AF6C  
(714) 639-5074  
[AF6C@w6ze.org](mailto:AF6C@w6ze.org)

**Members @ Large:**

Dan Dankert, N6PEQ  
(714) 544-9846  
[N6PEQ@w6ze.org](mailto:N6PEQ@w6ze.org)

Hank Welch, W6HTW  
(562) 697-2239  
[W6HTW@w6ze.org](mailto:W6HTW@w6ze.org)

**2008 Club Appointments:**

**W6ZE club license trustee:**

Bob Eckweiler, AF6C  
(714) 639-5074  
[af6c@arrl.net](mailto:af6c@arrl.net)

**Club Historian:**

Bob Evans, WB6IXN  
(714) 543-9111  
[bobev@netzero.net](mailto:bobev@netzero.net)

**RF Editor for October:**

Kristin Dankert, K6PEQ  
(714) 544-9846  
[K6PEQ@w6ze.org](mailto:K6PEQ@w6ze.org)

**WEB Master:**

Ken Konechy, W6HHC  
(714) 744-0217  
[kkonechy@pacbell.net](mailto:kkonechy@pacbell.net)

**ARRL Assistant Director:**

Ken Konechy, W6HHC  
(same as above)

**ARRL Awards Appointee:**

Larry Beilin, K6VDP  
(714) 557-7217  
[k6vdp@aol.com](mailto:k6vdp@aol.com)

**OCCARO Delegate:**

Loran Dargatz, KD6LRD  
(714) 777-9081  
[dargatzLR@msn.com](mailto:dargatzLR@msn.com)

**MONTHLY EVENTS:**

**General Meeting:**

Third Friday of the month  
at 7:00 P.M.  
AMERICAN RED CROSS  
601 N. Golden Circle Dr.  
(Near Tustin Ave. & 4<sup>th</sup> St.)  
Santa Ana, CA

**Club Breakfast:**

First Saturday of the month  
at 8:00 am  
Jaugerhaus  
2525 E. Ball Road  
(Ball exit off 57 freeway)  
Anaheim, CA

**Club Nets (W6ZE):**

7.086 ± MHz CW OCWN  
Sunday 9-10 a.m.  
Rick KF6UEB, Net Control

28.375 ± MHz USB  
Wednesday 7:30-8:30 p.m.  
Bob AF6C, Net Control

146.55 MHz Simplex FM  
Wednesday 8:30-9:30 p.m.  
Bob, WB6IXN, Net Control



# Attention Members!!!

Do you know a fellow ham that would be interested in joining OCARC? Do you have a friend that is curious about ham radio and wants to learn more about our hobby? Why not invite him or her to one of our exciting monthly meetings?!?! The meetings are fun, informative and entertaining. And don't forget about the raffle prizes too. So bring a visitor to one of our meetings, and help **your** club expand!

Make sure to inform your friends of our club's website, which is always kept up to date. Information on club meetings, activities and our newsletter archive make it a worthwhile site to surf! <http://www.w6ze.org>

We hope to see you and a guest at our next meeting!

## Vice President Note

It's that time of year again...time for the Club Auction! Clean out the shack and garage and bring your treasures on down to the meeting. Avoid spending money on recycling fees and make an extra dollar for the Club too. All are welcome, members and non-members alike. November is the month for the Election of Officers. We need people with good ideas! Please consider running for an office if you have never done so before. And remember, the Christmas party is around the corner, too along with the opportunity to win great prizes. See you all at the auction!

73 DE AF6CF

# W6ZE QSL Card Contest

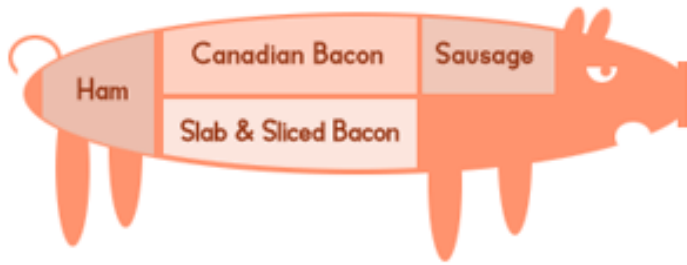
W6ZE is holding a QSL card contest. We need new cards and it is up to you to design it and choose it! You have two months to come up with a design, draw it up and get it to a board member. We will vote on the designs at the Holiday party, December 12<sup>th</sup>! We still will need the basic contact information on it but the rest is up to you. I cannot wait to see all of the designs!

## Morse Code Class

.. \_ . \_ . \_ . . ... \_ . \_..?

In January or February we are thinking about holding a morse code class. This class will be held at a member's home and will cover the morse code alphabet, practicing morse code and more. If you are interested in this class or would like to help out, let us know!

QuickTime™ and a  
decompressor  
are needed to see this picture.



## *Ham Cuisine*

*By: Kristin Dankert,  
K6PEQ*

## **Midwestern Delight Ham Sandwich**

### **Ingredients:**

6 slices (6 ounces) of thinly sliced ham  
4 slices of cheese bread  
2 tablespoons of reduced-fat mayonnaise  
1/8 cup roasted red peppers

### **Cooking Directions:**

Toast cheese bread. Spread one side of each slice with mayonnaise. Layer ham on two slices of bread. Top with peppers and remaining bread. Cut sandwiches in half and serve. Serves 2.

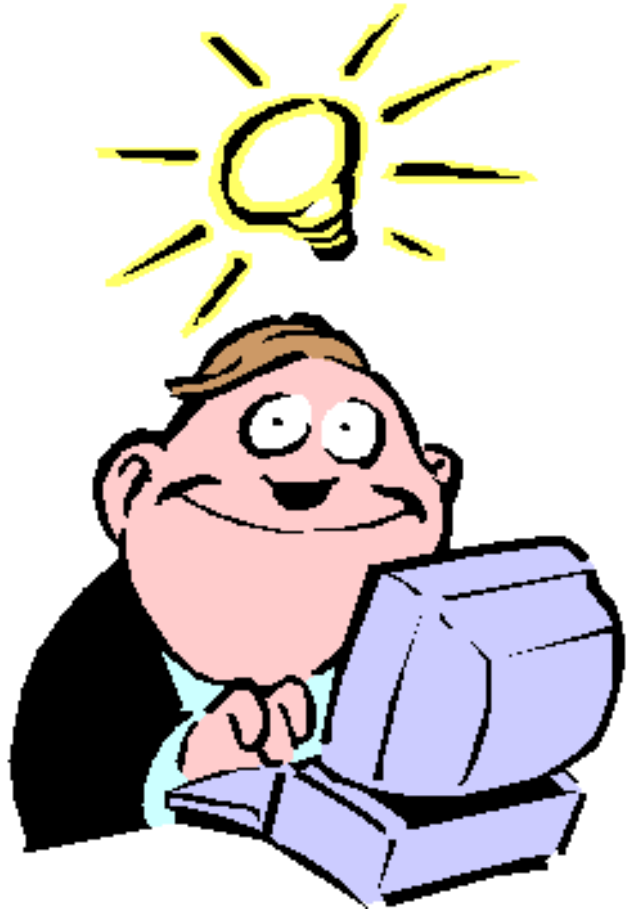
### **Serving Suggestions:**

Serve your ham sandwich with the unexpected flavor of roast peppers and cheese bread with potato salad and baby carrots.

Thanks to "The Other White Meat" website for this tasty recipe!

## NEWSLETTER ARTICLES NEEDED!

Do you have an idea for a newsletter article? Maybe you have acquired a new piece of equipment, designed or constructed a new antenna, took a trip focused around ham radio, want to share an amateur radio related experience or discuss a technical topic. Why not write an article for the monthly RF newsletter? The article can be short or long, simple or elaborate, and can even include pictures! The RF newsletter relies on articles from our members. So why not give it try? Write an article and send it to the newsletter editor. It's fun, and at the same time, your contribution helps support our club and hobby!





## OCARC General Meeting Minutes

### 9/19/2008

The OCARC September General Meeting was held at the Red Cross complex in Santa Ana at 7PM on Friday evening, Sept 19th. There were a total of 57 members and visitors present. A quorum was present with 9 of the club directors attending, including Willie-N8WP who participated from near Boston via SKYPE.

#### **PROGRAM:**

The great program was:

#### **“OCARC 75<sup>th</sup> Anniversary Celebration and Reunion”**

VP Nicholas-AF6CF conducted a celebration for the 75<sup>th</sup> Anniversary of the OCARC founding back in 1933. This included a re-union of past members, some far away with past Presidents N6XTJ from Ojai, and K7ZE from Las Vegas and W6ZQ from Arizona. Three members checked into the meeting by SKYPE: Jim Trip-WA6DIJ near Monterrey and Bob Buss-KØBWH in North Dakota and President Willie Peliquin-N8WP near Boston. There was a great turn out with a highlight of the meeting being the opportunity for each member to describe his association with ham radio and the OCARC.



**Fig 1 – Ken-W6HHC (L) controls the SKYPE connection, while Kris - KC6TOD takes a turn at the microphone to tell about her experiences.**

There was plenty of pizza to nibble on, a display of very very old radios, discussions of a proposed club “time capsule” to be opened 25 years from now, and plenty of time for friends to catch up on past happenings.

The OCARC Historian, Bob Evans WB6IXN, displayed many of the folders that he maintains containing artifacts from the club over the past 75 years.



**Fig 2 – Historian Bob-WB6IXN described what collections he has preserved for the OCARC.**

## A HISTORY OF THE ORANGE COUNTY AMATEUR RADIO CLUB - Part 8

by Bob - WB6IXN, Club Historian

### \*\*\* A NEW ERA – cont'd \*\*\*

During 1977, Vic, WA6RNA, a volunteer instructor at the Long Beach VA Hospital, needed a 2m transceiver and antenna. OCARC member, Lee, WA6FSP, immediately donated his EICOM 230 with power supply. Ray, WA6TEY, and Ernie, WA6FOW, plus other hams, constructed the antenna for the hospital station. Roy, K6IQ, had his mobile rig, a Kenwood TR-7400A, stolen. The annual Christmas dinner was again held at the Crossroads Restaurant in Fountain Valley.

In January, 1978, Jim Kingsbury, WA6LFF, was became the new president. Bill Myatt, WA6YKH, and Jack Lockhart, WD6AEI, conducted the class for Novices. Al Watts, W6IBR, and Dave Matherly, WD6ABB, conducted a General Class licensee program. During the 1977 and 1978, the Club again became active in 2m T-hunts. Bill, WA6KHB, received the ARRL Public Service Award in February. Field Day was once again held at MCAS on June 24-25. We had 2,600 contacts for 5,986 points, operating 80-10 meters, Novice, and 220 MHz/F3.

The club president in 1979 was Terry Mathers, WB6IHZ. The big event for 1979 was the ARRL Southwestern Division Convention held Oct 19-20 at the Sheraton-Anaheim Hotel near Disneyland. Our own Ralph Alexander (Alex) W6RE was Chairman of the ARRL convention.

In February, Jim Kingsbury, WA6LFF, became president of the Orange County Council of Amateur Radio Organizations (OCCARO). We also congratulated Fried, WA6WZO, for his high score in the I.A.R.U. Radio Sport Championship, and also for Fried's appointment as Assistant Director of ARRL, Southwestern Division.

Jay Hall, MOK, resigned as vice president, and he was replaced by Ernie Prichard, WA6FOW. Sandi Heyn, WA6WZN (Fried's XYL) got her Extra ticket. Frank, WA6VKZ, coordinated Field Day. Field Day was held on June 23 and 24 at the Marine Corps Air

Station in Tustin. Ken, W6HHC, organized a Club July salt-water fishing trip for club members. At Field Day, the Club had 2,266 QSOs for a total of 5,018 points.

In 1980, Ernie Prichard, WA6FOW, was the elected president. OCARC sponsored an Orange County 40 meter QSO Party held on Jan. 13, 1980.

OCARC also sponsored the VIP-ARC for visually impaired pupils. Marty, WD6AUS; Vic, WA6RNA; Al, W6IBR; and Alfred, WD6DIY, were all involved in the VIP program. 1980 was a strong year for the Visually Impaired Program! VIP had three 40 thru 2 meter stations on the air at three different area schools: Circleview, OSD; R.H. Dana & Crown Valley Schools, C.S.D. Safeco Insurance Co., and Rotary International, among others, made donations to support the club-sponsored VIP program.

Jess, W6LEN, handled the U.S. & Foreign Callbook listings for the Club members. Vic, N6AHB, took charge of the Novice class for the Club. Seven Club members volunteered to participate in the Boy Scout 5-Km Run in August, providing 2-member communications for the operation. Johnny Sidler, WA6OZF, became a Silent Key. Ralph (Alex) Alexander, W6RE, was made an honorary member of the OCARC.

We thanked Ken, W6HHC, for the many fine programs he has presented over the years on slides from past Field Days. Field Day was held at the USMC Mars Station in Tustin. We had 2,849 QSOs for a total of 7194 points...Best Field Day yet for the OCARC!

In August, Fried, WZO, announced his candidacy for Director of the ARRL Southwestern Division. Ken, W6HHC, was auctioneer for the Club's Annual Auction in Oct. The Christmas Banquet was held at Longfellows Restaurant in Anaheim. Alex, W6RE, and others provided communications for the Red Cross during fire operations near O'Neill Park, both from their homes and at the O'Neill Park Base Camp.

(to be continued next month

...Bob Evans, WB6IXN, Club Historian.)



## **W6ZE Time Capsule**

We are getting close to sealing up the 75<sup>th</sup> anniversary W6ZE time capsule. The time capsule will be sealed at the Holiday Party on December 12<sup>th</sup>! If you would like to put a QSL card or badge in the capsule, please bring it to one of the upcoming meetings. We will be opening the time capsule at the 100<sup>th</sup> anniversary W6ZE celebration! Also, if you have any other ideas on what you would like to be placed in the capsule, please let our VP, AF6CF-Nicholas know! We already have some projector slides of W6ZE, some magazines from the year the club was started and a few other items. Make sure you are a part of your club's history!

## Huntington Beach Transmitter Hunt October 18

Huntington Central Park will be the site of Southern California's next international-style on-foot foxhunt. This event is free and open to everyone who wants to see and try the sport. Courses will be designed primarily for beginners and intermediate foxhunters, not for experts. A ham radio license and knowledge of radio equipment is not required. Come out and try fox tailing for yourself. Bring the kids and grandkids. Beginners may go out as individuals or in small groups. An adult should accompany ☐ Young children. ☐☐ Practice and beginner 2-meter transmitters will go on the air around ☐ 10:00 AM and the main 5-fox hunt will begin at 10:30 AM. You can start hunting at any time up until 1:30 PM. There are picnic tables nearby, so you can bring your lunch. Courses close at 3:30 PM. ☐☐ We will start from the parking lot at the north end of the park. The entrance is on the south side of Slater Avenue, east of Golden West Street intersection. Map at <[www.homingin.com](http://www.homingin.com)>. There are no fees for entry or parking, but parking may be limited depending on other activities in the park that day. Look for the orange and white Orienteering flag and signs. Call KoOV or WA6OPS on 146.970 simplex if you have trouble finding the site. ☐☐ Bring any 2-meter RDF "sniffing" gear you have. If you don't have any, just bring your HT or scanner. A limited number of RDF sets will be available for loan. Also be sure to bring anything you'll need while going after those radio foxes, such as munchies, bottled water and sunscreen. Course maps will be available, so bring your own compass, protractor and pencil. Make sure all batteries are fresh. ☐☐

**73, Joe Moell KØOV**

### 2008 CONTEST SCHEDULE

#### NOVEMBER:

- |       |                                   |
|-------|-----------------------------------|
| 1-2   | ARRL November Sweepstakes (CW)    |
| 15-17 | ARRL November Sweepstakes (Phone) |

#### DECEMBER:

- |       |                        |
|-------|------------------------|
| 5-7   | ARRL 160 Meter Contest |
| 13-14 | ARRL 10-Meter Contest  |

Hope to hear you in the next Contest!

# OCARC MEMBER POTLUCK



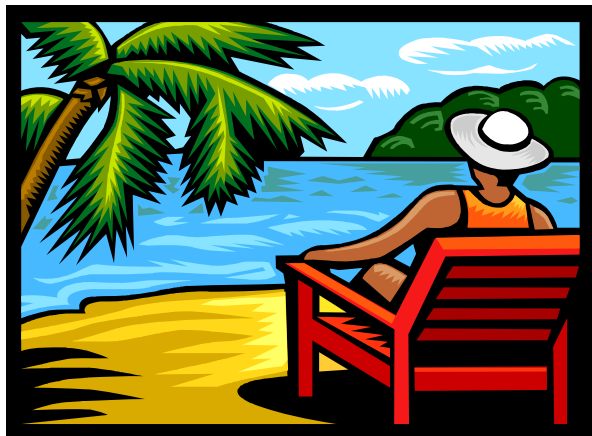
October 25!

**QTH:** Dan (N6PEQ) and Kristin's (K6PEQ) home

**When:** October 25<sup>th</sup>, 11 a.m. until ?

**What to Bring:** You, a friend or significant other and a food item. If you are unable to attend a meeting to sign up for food but would like to attend the potluck, please e-mail Kristin-K6PEQ at [k6peq@w6ze.org](mailto:k6peq@w6ze.org).

We will be providing hamburgers and hot dogs. We hope you will be able to come and have fun!



**OCARC**  
**Board Meeting Minutes**  
**2008-10-04**

The OCARC Board meeting was held at the JagerHaus Restaurant in Anaheim at 8:15AM on Saturday, 2008-10-04. There were a total of 6 members and visitors attending at the restaurant. There was a quorum of directors participating, with the five following officers: Nicholas-AF6CF, Ken-W6HHC, Kristin-K6PEQ, Dan-N6PEQ present, and also Paul-W6GMU participating by Speaker-Phone.

**DIRECTOR REPORTS:**

- **Vice President** - Nicholas AF6CF reported that the following programs are planned:
  - October is OCARC Auction
  - November is Clipperton Island DXpedition
  - January is Chip-K7JA on Russian DXpedition
  - February is John-KI6MCB
  - March is a new Digital Radio Tutorial via DVD
- **Secretary** – Ken-W6HHC reported that we had received a dues check from re-joining member Robert-KG6WTQ.

**OLD BIZ:**

- **RF NewsLetter “Rotating” Editors**
  - October is Kristin K6PEQ
  - November is Nicholas AF6CF
  - December is Bob AF6C
  - January is Ken W6HHC
- **OCARC 75<sup>th</sup> Anniversary Celebration**
  - The attendees at the club breakfast all had great compliments about the celebration and re-union. It was an enjoyable evening. Well Done!
- **Time Capsule**

The attendees at the club breakfast suggested including the following items in the club time capsule that will be buried this year:

  - Current QST and CQ magazine
  - Members donating old OCARC badges

• **Auction**

- Rules for the OCARC will be published in RF (same rules as last year).
- Nicholas-AF6CF will organize the team of auctioneers. Paul-W6GMU and Ken-W6HHC will handle the money matters at the auction.

• **OCARC Christmas Party**

The OCARC Christmas Party is planned for Friday, Dec 12th. Details will appear in this issue of RF Newsletter. Dan-N6PEQ reported that he was gathering up prizes for the party raffle.

• **Club QSL**

A discussion was held that we should hold a contest to design a new QSL card for use by the OCARC and its members. Details to follow.

**NEW BIZ:**

• **Amendment to OCARC BYLAWS**

The OCARC BYLAWS currently allows all Directors to serve up to two consecutive terms, except for the Treasurer. The board members agreed that this provision does not really make sense. Any change to the OCARC BYLAWS needs to be approved by the club membership at two separate meetings. The club secretary will present the following amendment to the membership at the next two meetings and general membership will vote on the amendment at the Nov general meeting:

**”The officers elected to serve may hold office for two consecutive years if so elected annually by the membership. This amendment supersedes the current Amendment C that was approved in Nov 2000.”**

Submitted by: Ken Konechy W6HHC  
Secretary

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## Orange County Amateur Radio Club - - W6ZE

### ANNUAL AUCTION Friday, OCT 17, 2008

#### Auction rules

The OCARC Annual Auction will take place on Friday evening, October 17th, 2008, at 7:00 PM at the American Red Cross facility located at 601 N. Golden Circle Drive, Santa Ana. The room will open at 6:00 PM to allow registration, set-up and viewing. All buyers and sellers are welcome. The following rules for the auction will be in effect:

- 1) Only Ham Radio or electronic equipment/items will be auctioned (that is: no fishing equipment, etc)
- 2) Buyers and Sellers must register at the door with the OCARC treasurer. There is NO registration fee.
- 3) Only 3 items from a Sellers lot will be auctioned during each turn. After auction 3 items, the auctioneer will move on to the next lot. After the first 3 items from every lot have been offered for bidding, the auctioneer will start the second round of auctioning with the next 3 items in Lot #1.
- 4) Sellers should number each item in their lot. A tag should indicate the minimum bid they expect.
- 5) Auction bidding will take place as follows:
  - (a) \$0.00-to-\$5.00 bidding will take place in \$0.50 increments.
  - (b) Over-\$5.00-to-\$50.00 bidding will take place in \$1.00 increments.
  - (c) Over-\$50.00-to-\$100.00 bidding will take place in \$5.00 increments.
  - (d) Over-\$100.00 bidding will be in \$10.00 increments.
- 6) Payments for purchased items are due at the end of the auction and shall be by cash or check with the appropriate ID. No two-party checks or credit cards are allowed. Disbursements to the Sellers will be by OCARC check, only. Sellers will be charged 10% of the selling price for items sold by OCARC.

A special table will be set up for donated items. The proceeds of donated items will go to the OCARC

### Proposed OCARC BYLAWS Change

An amendment is being proposed to the BYLAWS of the Orange County Amateur Radio Club. The board has recommended changing the bylaws to remove the existing restriction that the Treasurer cannot be elected two consecutive years. It is being proposed that:

**"The officers elected to serve may hold office for two consecutive years if so elected annually by the membership. This amendment supersedes the current Amendment C that was approved in Nov 2000."**

The proposed amendment will be read at the club's October and November general meetings and then put to a vote at the November general meeting. In order to change the bylaws, a two-thirds affirmative vote by the membership present is required. A current copy of the OCARC BYLAWS is available for your review on the WEB site, under the "How to Join" link on the first page.



## OCARC Holiday Party!!!! December 12<sup>th</sup> - Save the Date!

Come and celebrate the Holiday season with OCARC on Friday, December 12<sup>th</sup>. See Paul, W6GMU at an OCARC general meeting or OCARC club breakfast, or e-mail him at [w6gmu@w6ze.org](mailto:w6gmu@w6ze.org) to arrange purchasing your holiday party dinner tickets! Remember to bring your spouse and friends too! Dinner tickets are only \$24 per person and it includes family style food, non-alcoholic beverages and dessert. Check the club website for upcoming info and details coming soon (<http://www.w6ze.org>). We will be having a great raffle again this year. Stay tuned for the announcement of the grand prize!

Mark the date on your calendar!  
**Friday night, December 12<sup>th</sup> at 7:00pm.**

**Location: Jagerhaus Restaurant**  
2525 East Ball Road , Anaheim, CA 92806  
Located on Ball Road, just west of the  
57-Freeway. [www.jagerhaus.net](http://www.jagerhaus.net) 714-  
520-9500

**See Kristin "K6PEQ" at the party  
to purchase your raffle tickets.  
The tickets are only \$1 each!**



**Orange County Amateur Radio Club, P.O. Box 3454,  
Tustin, CA 92781**

**<http://www.w6ze.org/>**



## Pictures of OCARC 75<sup>th</sup> Anniversary Celebration and Reunion



There was a great turn-out for the Celebration. Member AI-W5KGM (white hat) was 1<sup>st</sup> licensed in 1934



VP Nicholas-AF6CF was the Master of Ceremony (and chief organizer) for the OCARC 75<sup>th</sup> Celebration and Reunion



Wayne-W6IRD was instrumental in setting up some VERY OLD radio artifacts for a display



Ken-W6HHC used SKYPE to allow far-away hams to talk at meeting: WA6DIJ near Monterey, KØBWH in ND and N8WP near Boston



Club Historian Bob-WB6IXN displayed many of the club's history archives. Looking on is past-Prez Jim N6XTJ from Ojai.



There was plenty of pizza, salad, soda, and "eye ball QSOs" during the break.



Kristin-K6PEQ was in charge of the food and made many trips between the kitchen and meeting room



Past President Larry-K6LDC



Past President Jack-N6UC

**More Pictures of  
OCARC  
75<sup>th</sup> Anniversary Celebration and Reunion**



**Past President Bob-AF6C also took lots of pictures at the celebration**



**Honorary member Chip-K7JA speaks to the SKYPE crowd**



**Sharon-K6IRD came in a wheel chair as a result of a foot operation**



**Long time member Chris-W6KFW**



**Past President Kristin-K6PEQ with hubby, Dan-N6PEQ**



**Past President Fried-WA6WZO with wife, Sandi-WA6WZN**



**George-N6VNI with wife, Kris-KC6TOD**



**Past President Ron-W6ZQ with wife flew in from near Tucson**



**Past President Art-K7ZE with wife, Jaycee drove in from Las Vegas**



**Heathkit of the Month:  
by Bob Eckweiler - AF6C**

**The Heathkit IT-12  
Visual - Aural Signal Tracer**

This month we're going to look at a piece of inexpensive Heathkit test equipment. If you ever worked on a ham receiver or even an old AC-DC radio, stereo or phonograph, the signal tracer is second only to the voltmeter as a tool for troubleshooting, especially if you don't own a quality oscilloscope.



**Heathkit IT-12 Signal Tracer**

**The Signal Tracer:**

A signal tracer is a high-gain audio amplifier, with a built-in speaker and visual signal indicator. Two probes provide input to the signal tracer. One probe directly connects the input for troubleshooting audio signals. The second probe includes a crystal diode for troubleshooting modulated R.F. signals. Often the probes are combined into one probe with a two-position switch for selecting the probe's function.

**Using a Signal Tracer:**

Using a signal tracer is quite simple. A signal source is input to the 'device under test' (**DUT**). For a receiver, a modulated RF signal generator, or even a local radio station will work. For an audio device, a record, tape, or other audio signal is used. The DUT is then probed one stage at a time. Thus it is easy to find which stage is malfunctioning, whether it is a total loss of signal, distortion, noise or low gain. For example, to troubleshoot a superheterodyne shortwave receiver, first apply a known RF signal. When the RF probe is placed on the grid (or base) of the RF amplifier stage you should hear the signal. The probe is then moved to the plate (or collector) of the RF stage and the signal checked again. If the stage has gain you should notice it by the indicator and the increase in signal volume. This procedure is repeated in the mixer stage(s) and subsequent IF stages. At the detector stage the audio probe is used instead of the RF probe and tracing continues. A sudden loss of signal or other problem tells which stage or interstage coupling is at fault. From there it's usually a simple matter to measure voltages and find the component that is faulty.

**Heathkit IT-12 Features:**

The Heathkit IT-12 has a few additional features that add to its capability. External terminals are available for the speaker and the primary output transformer. Front panel switches isolate the speaker and transformer so they can be used for substitution in the device under test. The speaker is handy for radios that don't have built-in speakers.

A second feature that is very handy is the **NOISE** feature. Sometimes

components get noisy and this can be very difficult to trace. After you determine the stage where the noise is originating using regular tracing techniques, the DUT is turned off and the noise feature on the IT-12 is turned on. This puts about 140 VDC (current limited) on the probe. When touched to a component in the DUT a single click is heard in the speaker of the IT-12. If the component being probed is intermittent or breaking down, the noise is continuous and that component needs to be replaced. This method can even detect cold soldered joints.

### **Heath Signal Tracer History:**

To get an idea of what a valuable troubleshooting device the signal tracer is, Heathkit introduced their first model, the T-1 in May of 1948, and continued to manufacture updated models until Heath went out of the kit business in the early nineties.

### **Heathkit T-1:**

The original Heathkit T-1 uses three octal tubes: a 6SJ7 audio amplifier, a 6K6 audio output and a 6X5 power supply rectifier. The RF probe contains a crystal diode and connects to the T-1 by banana plugs. The original T-1 cost \$19.50 and remained in production for eleven months until April of 1949, when it was replaced by the T-2.



**Ad for the Heathkit T-1 from an October 1948 Heath flyer**

### **Heathkit T-2:**

The T-2 is similar to the T-1 except it uses a 6SH7 audio amplifier tube and has a multi-position switch that allows numerous different matching impedances when using the speaker output transformer externally. The cost remained \$19.50. It remained in production until October of 1952 when it was replaced by the T-3.

### **Heathkit T-3:**

When Heathkit introduced the T-3 Signal Tracer in 1952 they made many significant changes that brought the tube count up to five. The 6X5 remains as the power supply rectifier. The rest of the tubes were changed to 12-volt filament types. The 6K6 audio output tube was changed to a 12A6 and the 6SH7 audio amplifier to a 12SH7. The T-3 has separate inputs (and probes) for audio and RF. The RF section has an additional stage of gain using a 12C8 tube. On the T-1 and T-2 there is no visual indication of signal level; however they have jacks where you may connect a VTVM. This changed on the T-3 with the addition of a 1629 "Magic Eye" tube. The 1629 was used in the WW-II Command Set transmitters and

was very common and inexpensive on the surplus market at that time. The eye-tube provides indication of relative signal strength. The T-3 also has an unusual feature. It can measure the power consumption of the DUT. The device is plugged into a special AC outlet on the T-3 and turned on. Once the device warms up, a control on the T-3 is adjusted until the eye just closes but does not overlap. The power consumption of the DUT can then be read on the scale of the control. The 12C8 RF amplifier doubles as a diode for the wattmeter function. The added features of the T-3 raised its original price to \$22.50. The T-3 remained in production until the end of 1957 when it was replaced by the T-4.

#### **Heathkit T-4:**

The T-4 was a totally new design. The price of the T-4 dropped back below \$20 and it remained in production until 1962 when it was given a new cabinet color scheme and renamed the IT-12. Other than the new case the two circuits are identical.

#### **Heathkit IT-5283:**

In Early 1978 Heathkit stopped production of the IT-12. In its place they introduced a line of five solid-state low-cost test equipment pieces that run on batteries or a common power supply. This is the 5280 line and includes the IG-5280 RF Oscillator, IB-5281 RCL Bridge, IG-5282 Audio Oscillator, IT-5283 Signal Tracer, and IM-5284 Multimeter. When Heathkit went out of the kit business only two of these kits were still being made, the audio oscillator and, showing its versatility, the signal tracer. Near the end the IT-5283 sold for \$59.95. up some from its original \$42.95 price.

#### **The Heathkit IT-12:**

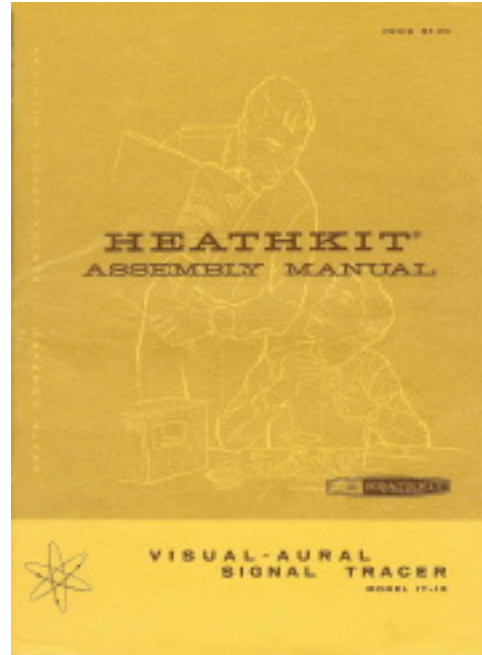
The IT-12, and its electrically identical predecessor the T-4, was the first in the signal tracer line to use miniature seven and nine pin tubes (except for the 1629 eye-tube). A 50 ma selenium solid-state rectifier replaces the rectifier tube. The IT-12 uses a single probe with an RF - AF switch. As in the T-3, 12-volt filament tubes are used. This is driven by the 1629 having a 12-volt filament. The IT-12 uses three tubes, the 1629, a 12AX7 dual triode that performs as two stages of cascaded audio amplification, and a 12CA5 audio output tube.

Front panel controls are few and simple. A two position rotary switch selects OFF/ON. In the OFF position the primary of the output transformer is isolated from the power supply so the transformer may be used as a substitute transformer. (Many older consumer devices have their speaker and occasionally their output transformer mounted to the cabinet so when the chassis is removed from the case they are not present on the chassis). A LEVEL control adjusts the gain of the audio amplifier. A SPKR slide switch disconnects the speaker from the internal transformer so it can be used as a substitute speaker. A NOISE slide switch places DC voltage on the Probe tip (Audio Position only) for checking components. Another slide switch on the probe, AUDIO/R.F. switches in or out the crystal detector circuit in the probe. Five binding posts are located on the front panel. Two connect directly to the speaker, and three, marked B+ CT and P, connect to the three primary leads of the audio output transformer. Other front panel items are the 3-1/2 inch speaker and "Magic Eye" display tube.

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The IT-12 may be used with transistor circuits with one warning. The noise circuit can damage solid state and low-voltage components if used indiscriminately. However many components may be checked if one end is disconnected from the circuitry prior to the check. The manual gives recommendations for doing this.

The IT-12 originally sold for \$19.95. When discontinued at the end of 1977 the price had risen to \$34.95.



### **Summary:**

This is a very versatile piece of test equipment for people troubleshooting receivers and audio electronics. Long after Heathkit became history, its simple signal tracers remain a common tool for repairing communications receivers and audio circuits and devices.

## OWENS VALLEY RADIO OBSERVATORY TRIP

### SCIENCE BEYOND THE BOOK

July 26, 2008

By Paul, W6GMU & Nicholas, AF6CF

If you ask mountain climbers why they go all the way to a remote mountain top just to come back down, in most cases they will give you a blank stare, as their passion cannot be easily explained. If you ask us why anybody would drive over 600 miles in a day just to climb an antenna the size of a football field, we may have the same reaction, or, as communicators, may come up with some sort of explanation.

Invited by Dr Doug Millar K6JEY, On July 26, 2008 two OCARC members, (Nicholas AF6CF and me) and George Rubino, (OC Astronomers Club member) went to



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the Owens Valley Radio Observatory outside of Big Pine, CA. The original plan was to spend the night in an RV and come back on Sunday but because of conflicting work schedules, we decided to make it a day trip.

So we started early in the morning and headed up north to Owens valley. The trip was uneventful, and when we got near the site we could see the big antenna from several miles, so we knew that this was “The big one”



case of a malfunction.



But when we got close, we could really appreciate the size of this monster!

Just note the automobiles dwarfed by the 40 meter antenna.

Once inside, we went to the control room.

Most of the 1970's instruments have been replaced by computerized interfaces controlled remotely from across the globe, so the only remaining controls are those that will retain a degree of “manual override” in

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All the time we were inside the control room, the indicator wheels were constantly turning and we could feel the giant antenna moving above us.

Close to the antenna there is a control building that houses the local data storage disk array and the Internet communications hub for the antenna.

Outside, there are a couple of small dishes to receive GPS timing and position signals, so the antenna is always pointing in a known direction at a known time.

The control and power lines are located underground, so the antennas and buildings all look as if they are sitting in “the middle of nowhere”, giving the installations some sort of Sci-Fi look.

Because there is no visible light coming from some of the objects that are radio emitters in the universe, there is no simple way to tell exactly where the radio telescope is pointed, so they have to depend on known sectors of the sky and the mechanical precision of the assembly to tell its position, and relate the received signals (and noise) to certain celestial objects.

This antenna was used by the San Bernardino Microwave Society team legendary moon bounce experiments that attracted worldwide attention.

See <http://www.ham-radio.com/sbms/ovro/> for details and history of the experiments.



View of some of the instruments at the control room, most of them obsolete and replaced by Internet connected computer control systems.

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These are the Azimuth and antenna position indicator wheels shown by Dr. Mark Hodges.



Dr. Doug Millar explains the antenna position relative to the control system input.



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While in the control room, we viewed a science demonstration courtesy of Dr. Mark Hodges of Cal Tech.

This was a very “cool” presentation explaining that the microwave sensors had to be cooled down with liquid nitrogen in order to reduce their noise figure. Just to prove the point and show the physical properties of the liquid N<sub>2</sub>, he proceeded to do a series of experiments.



The liquid nitrogen experiments were extremely interesting and very “hands-on” and were really “cool” and educating. The school grade kids in the audience were really fascinated by the experiments.

Some of the experiments included freezing a banana that shattered like glass, and a lead bell that when frozen, sounded like the best brass.

Also he showed how a balloon contracts dramatically when frozen and regains its shape at ambient temperature and the difference between an old copper penny and the newer, zinc-core copper plated ones. When frozen, copper pennies will deform with a hammer blow while the newer ones will completely shatter.



However, one of the most interesting demonstrations (for us) was the superconductor material.

Dr Hodges poured some liquid nitrogen on a Petri dish with some insulation and a piece of super conducting material.

When the material reaches a low temperature, its resistance drops to absolutely zero, thus the name of superconductor.

Having no resistance to the electric current, any exterior magnetic force on this material will generate an electric field that has no opposition inside it, so this induced electric current will generate in turn another magnetic field that will oppose or repeal the first one.

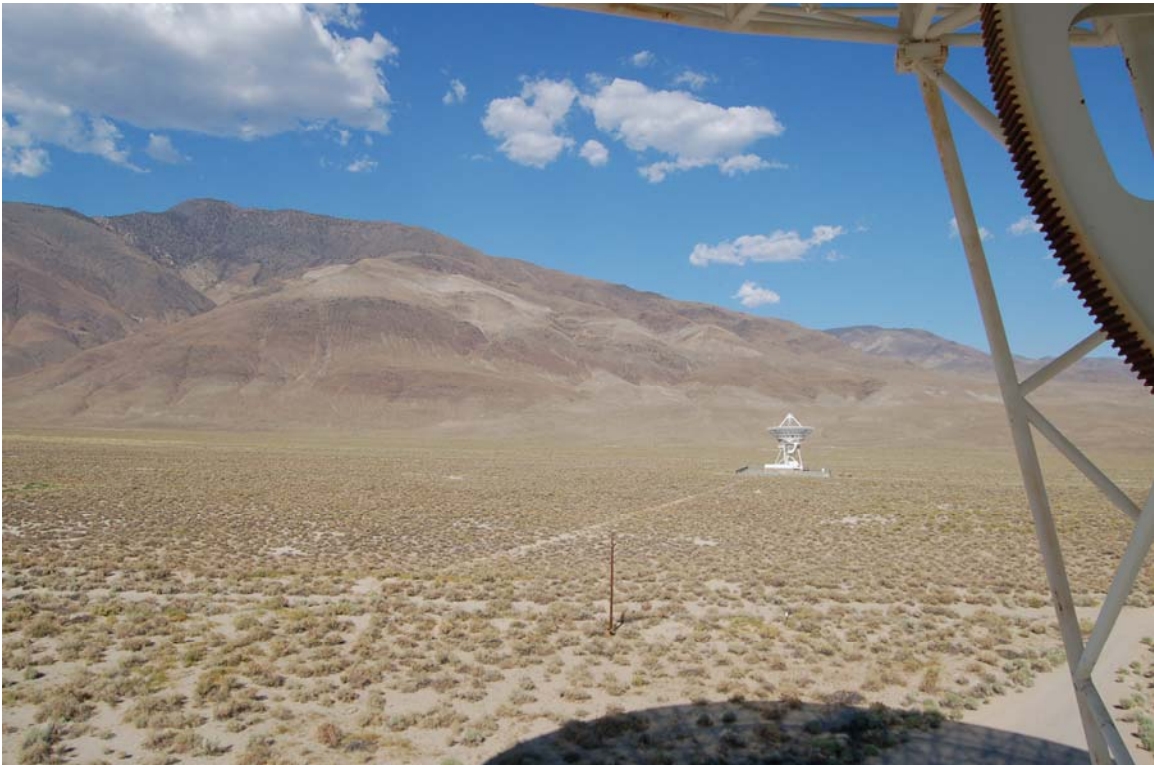
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The result: **Levitation!**

Dr Hodges placed a small magnet on top of the superconductor and the magnet just floated in the air on top of the dish, even moving or slowly rotating but still suspended in the air. When the nitrogen evaporated and the material warmed up, the small magnet fell.

The demonstration finished with a big liquid nitrogen splash with all the presents jumping up and down when the “wave” reached them.

Then we all climbed to the antenna base to get a view of the dish and the valley below.



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After a few moments of admiring the antenna construction and features, we went down to the adjacent control building, which had restrooms and air conditioner, so we stayed there resting until it was time to go back home.

On our way back, we stopped for dinner at the Country Kitchen in Big Pine, a place that reminded Nicholas of the novel "Lord of the flies". Everybody else agreed.

All in all, it was a very interesting and educating trip and we all agreed that it was worth the effort.

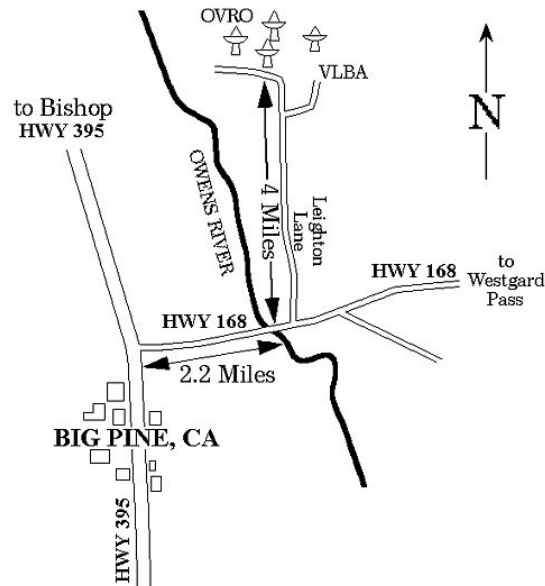
For more information look on the web at:

Owens Valley Radio Observatory: <http://www.ovro.caltech.edu/>

Other trips and projects are on: <http://www.k6jey.com>

EME experiments info at: <http://www.ham-radio.com/sbms/ovro/>

OC Astronomers Website: <http://www.ocastronomers.org>



### Directions:

From LA, drive up the 5 freeway to the 14 through Santa Clarita, Palmdale and Mojave. Continue on the 14 in the direction of Bishop out of Mojave and continue through Red rock Canyon, Inyokern, Little Lake, Lone Pine and Independence. The next town is Big Pine. The trip takes about 5 hours. Once there follow the directions below.

Although just 14 miles south of Bishop, the Owens Valley Radio Observatory is located closest to the town of Big Pine. At the northern tip of Big Pine, by a large pine tree, starts Highway 168. The only public access road to OVRO is via Highway 168. From Big Pine, turn onto Highway 168 and follow the road east. After approximately 2 miles you will cross the Owens River. Once across the river, turn down the first paved road to the left, Leighton Lane.