



RF



ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLVIII NO. 2

P.O. BOX 3454, TUSTIN, CA 92781-3454

FEB 2007

THE PREZ SEZ:



It is February, the month of love and overpriced flowers! One of my loves is Field Day! We had a successful first meeting for Field Day and we are planning the 2nd meeting for March 3rd at Los Alamitos Base after the Board Meeting. If you would like to participate in planning Field Day we hope you can make it! I would like to continue having show and tell at the meetings so bring something that you love about amateur radio to our next meeting to share! Since you are already bringing something for show and tell, bring a friend or fellow ham to the meetings as well. I am really excited about this year and I know it is going to be great!

73,
Kristin,
K6PEQ



Renew Your OCARC Membership

It's that time of the year again. Time to renew your OCARC membership for 2007, if you have not already done so.

Help continue to support your growing club. There are many entertaining monthly meetings, speakers and events planned for this year. But it can't happen without your support for OCARC.

Dues can be paid at the monthly club meetings, club breakfasts or via snail mail. Regular dues are only \$20. Additional family members are \$10 (Total). Membership for teenagers is only \$10 as well. What a deal!

You must renew by the end of March to remain a member.

OCARC
P.O. Box 3454
Tustin, CA, 92781



**Next Club Breakfast & Open Board Meeting
Sat. Mar. 3rd 2007**

FEB PROGRAM:

ARRL Orange Section Communications Manager Carl Gardenias WU6D will be our guest speaker at the February meeting.

Be sure to attend and keep abreast of new happenings in our hobby.

Hear what Carl has to say about the growth of ham radio now that the Morse code requirement is no longer a hurdle for prospective newcomers!



The next regular meeting is:

**Friday, Feb 16th 2007
@ 7:00 PM**

We will be meeting on the 2nd floor in the east bldg.

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**THE ORANGE COUNTY
AMATEUR RADIO CLUB,
INC.**

P.O. Box 3454, Tustin, CA 92781



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Loran Dargatz, KD6LRD
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dargatzlr@msn.com

2007 Club Appointments:

W6ZE Trustee:

Bob Eckweiler, AF6C
(714) 639-5074
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Club Historian:

Bob Evans, WB6IXN
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RF Editor for February:

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af6c@arrl.net

Webmaster:

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ARRL Awards Appointee:

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(714) 557-7217
k6vdp@aol.com

OCCARO Delegate:

Loran Dargatz, KD6LRD
(714) 777-9081
dargatzlr@msn.com

Monthly Events:

General Meeting:

Third Friday of the Month
At 7:00 PM
American Red Cross
600 N. Parkcenter Dr.
(near Tustin Ave. & 4th St)
Santa Ana, CA

Club Breakfast:

First Saturday of the
month at 8:00 AM at the
Jägerhaus Restaurant
2525 E. Ball Rd.
(Ball exit west off 57-Fwy)
Anaheim, CA

Club Nets (Listen for W6ZE):

7.086 ± MHz CW **OCWN**
Sun - 9:00 AM - 10:00 AM
Rick KF6UEB, Net Cntl.
28.375± MHz SSB
Wed - 7:30 PM - 8:30 PM
Bob AF6C, Net Control
146.55 MHz Simplex FM
Wed - 8:30 PM - 9:30 PM
Bob, WB6IXN, Net Control

VISIT OUR WEB SITE

<http://www.w6ze.org>

for up-to-the-minute club information, the latest membership rosters, special activities, back issues of **RF**, links to ham-related sites, vendors and manufacturers, pictures of club events and much much more.

Club Dues:

Regular Members \$20
Family Members* \$10
Teenage Members \$10
Club Badge** \$3

Dues run from January thru December & are prorated for new members.

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

**There is a \$1 charge if you'd like to have your badge mailed to you.

Bob AF6C's Beginner Talk

The Superheterodyne Receiver:

Wow, 'superheterodyne' is a big word. It is also the design that revolutionized receivers and is still the design of choice. What does this word mean and why is it so good? Today we'll explore those questions.

In the early days of radio the tuned radio frequency (TRF) receiver was common. Figure one shows its design. It consists of a number of tuned radio frequency amplifiers followed by a detector and an audio amplifier that can drive earphones or a speaker. Generally, these receivers tuned frequencies below one or two megahertz. Frequencies above that were considered unusable for broadcast. (The original ham band was all the undesirable frequencies below 200 meters – above 1.5 MHz).

Let's take a quick look at an RF amplifier. When properly designed it amplifies linearly; multiple signals on different RF frequencies are all amplified equally. In a TRF receiver there needs to be a way to separate signals or you will hear all the stations at once. Thus each RF amplifier is tuned using an LC circuit. This tuned circuit passes signals near its tuned frequency as shown in Figure two, and reduces signals away from the tuned frequency. The response of the filter depends on the 'Q' of the circuit. 'Q' is most influenced by the resistance of the coil.

The ability of a receiver to reject nearby signals is known as selectivity. In the TRF radio multiple tuned circuits are used for selectivity. As you change receiver frequency all these tuned circuits must tune together and track exactly – something that can be difficult to accomplish, especially at higher 'Q's. Also, tuned circuits are effective relative to frequency. At higher frequencies two signals must be further apart to be attenuated the same amount for otherwise identical tuned circuits.

Let's briefly look at the other parts of the tuned receiver. The detector separates the intelligence (usually audio) from the RF signal. There are numerous types of detectors: diode detectors for AM; product detectors for SSB, DSB and CW; and discriminators or ratio detectors for FM. Detectors are a thesis on their own, so for now just remember it's a circuit that separates the modulation from the RF signal. Next is the audio amplifier. It amplifies the audio so the intelligence may be heard through earphones or a speaker.

As TRF receivers are used for higher frequencies their selectivity becomes poorer and the tracking of all the tuned circuits becomes a nightmare, especially if band switching is involved (usually accomplished by changing plug-in coils.)

An advancement over the TRF is the regenerative receiver. It achieves high gain and selectivity by introducing positive feedback into an RF amplifier. It has a

lot of desirable features. It uses less stages and parts than the TRF. It can operate effectively at much higher frequencies (into VHF). On the negative side, it is more difficult to tune, has poor stability and requires careful adjustment of the feedback. Still the regenerative receiver gained a lot of popularity and was used in radios like the Heathkit "Lunchbox" and the National 1-10. Regenerative receivers are easy to homebrew. Still, they don't have the ease of tuning we have come to expect in our receivers today.

Let's look back at the tuned RF amplifier. At lower frequencies it provides reasonable selectivity but multiple tuned circuits are hard to track when tuning the radio. BUT, what if the receiver only tuned one frequency? Then you could use multiple stages with tuned transformers between them. The transformers only had to be tuned once and could be designed for higher 'Q'. Also since the frequency was fixed things like crystals with their very high 'Q' could be used as filters to improve selectivity tremendously. Alas though, you'd need a receiver for each frequency you wanted to listen to... or would you?

The Mixer

Let's go back to the RF amplifier again. Remember we said that a linear amplifier will amplify two signals equally. Well, if we design that amplifier with some built-in non-linearity we get a different response. In a non-linear RF amplifier the two signals interact so that at the output there are four signals, the two original signals plus a signal that is at the sum of the two signals and another signal that is at the difference of the two signals as shown in Figure four. (Actually there are other weaker signals too that we won't discuss here but do play a part in good receiver design.) Thus if you have a signal at 1 MHz and another at 1.455 MHz you will have four signals at the output. The two original signals plus slightly weaker signals at 2.455 MHz (the sum) and 0.455 MHz (the difference). This phenomena is called heterodyning and the circuit is called a mixer.

The Superheterodyne Receiver

Figure Three shows the design of a typical superheterodyne receiver. The desired signal is amplified by the RF amplifier and fed into the mixer. An oscillator operating at a frequency above or below the received frequency is ganged with the RF amplifier tuned circuit(s). As you tune the receiver the oscillator (called the local oscillator or LO) changes frequency so that it always remains a fixed frequency away from where the RF amplifier is tuned. This difference in frequency is called the Intermediate frequency (IF) and is the fixed frequency where most of the gain and selectivity is accomplished. The RF amplifier can now be designed to provide good signal to noise capability and good overload capability instead of gain and selectivity. The detectors and audio amplifiers operate simi-

larly to the ones in the TRF receiver.

One problem with the superheterodyne receiver shown in Figure three happens at higher frequencies. Let's look at receiving a signal at 28.455 MHz. At the higher bands the local oscillator usually operates below the received frequency so it would be at 28.000 MHz. If there is a signal at 27.545 MHz, the only thing keeping it from appearing at the IF frequency is the 'Q' of the RF amplifier's tuned circuit(s). If the signal is strong enough it will be heard. This unwanted signal is called an image. It can be reduced or eliminated by raising the IF frequency or by using two IF frequencies, two mixers and two local oscillators. Since the two IFs are fixed, the second LO can be crystal controlled. This type receiver is called "double conversion" superheterodyne. The first IF is usually only one stage but is high enough in frequency to reject the undesired image. Triple conversion receivers exist too.

Since superheterodyne receivers have oscillators in them, especially double and triple conversion receivers, a byproduct of these oscillators can appear as a signal in the receiver. This byproduct is called a "birdie". They always appear in a given receiver at the same frequency and receivers may have more than one. Designers choose frequencies within the receiver to minimize birdies or put them at frequencies where they do less harm.

A variation on the superheterodyne receiver seen in many ham receivers since the sixties (or even fifties for expensive receivers) is to have the first LO crystal controlled and the first IF have a wide bandpass of 200

KHz, 500 KHz or more. The second local oscillator is then tunable over one fixed range of 200 KHz, 500 KHz or more and the second IF is fixed. This feature removes the requirement that the tunable LO be switched to cover different frequencies on different bands and allows the tunable LO to be designed to operate very accurately. The Heathkit LMO and Collins PTO are examples of such oscillators. Heathkit's LMO tunes 500 KHz between 5.000 MHz and 5.500 MHz, and the Collins PTO (70K2 used in the 75S3) tunes 200 KHz between 2.955 and 3.155 MHz.

Today's receivers benefit from new technologies that were only dreams a few years ago. Phase-lock-loop oscillators provide tuning with crystal control stability and accuracy. Software designed radios handle signal processing digitally in inboard firmware. New RF amplifier designs provide sensitivity and signal to noise ratio improvements along with high immunity to overload. Filters provide high selectivity. Roofing filters, usually located just after the first mixer, reduce overloading and distortion from being created in the high gain stages of the IF by reducing or eliminating off frequency signals before they are amplified.

Heterodyning is also found in SSB transmitters. Generating an SSB signal at a fixed frequency allows easy design and the use of a crystal or mechanical filter to eliminate the unwanted sideband. The fixed SSB signal can then be heterodyned to the desired frequency and fed to a linear power amplifier for transmitting.

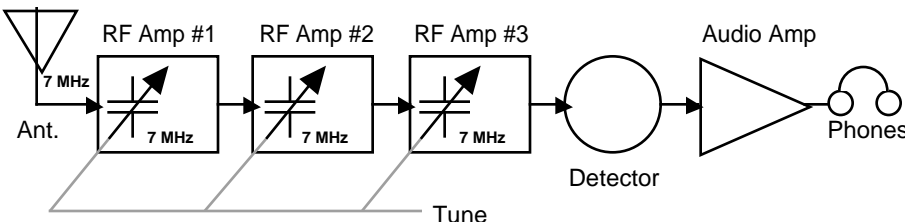
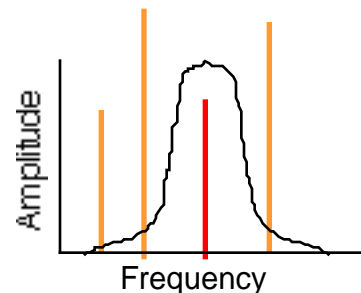


Figure 1 - TRF Receiver



desired signal
undesired signal

Figure 2 - Typical LC Response

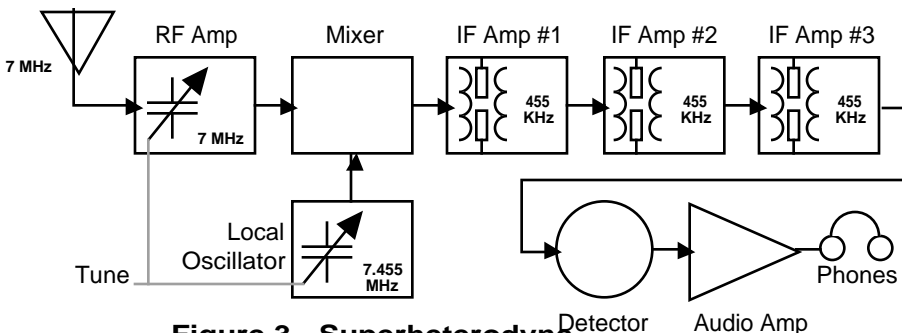


Figure 3 - Superheterodyne Receiver

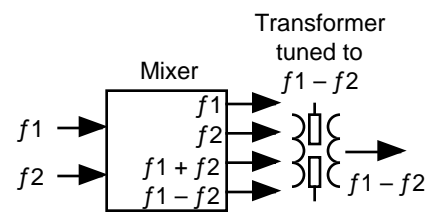


Figure 4 - The Mixer





Upcoming OCARC Events!!!

(Check the club website for updates and additions
<http://www.w6ze.org>)



February 16th (Friday 7:00 pm)

Carl Gardenias WU6D, our ARRL Orange section manager, will join us for a tentative presentation on happenings in the Orange section. Carl is always upbeat and leads an in-depth, motivating and compelling discussion.

March 16th (Friday 7:00 pm)

Mick Stwertnik KB6JVT of NCG Company will give a presentation on the latest and greatest products from NCG, Comet Antenna, Maldol & Daiwa. Here is your opportunity to ask Mick questions regarding his great line of products!



April 20th (Friday 7:00 pm)

April Moell WA6OPS of the Hospital Disaster Support Communications System is scheduled to give a presentation. Details to come!



The Orange County
Amateur Radio Club "OCARC"

P.O. Box 3454

Tustin, CA 92781

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

Email: ocarc_info@w6ze.org



You don't need to write like William "Bill" Shakespeare in order to write an article for the RF Newsletter. In fact, we prefer articles without the words "Thy", "Whilst", "'Tis" and "Oft".



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!

Dan, N6PEQ

VISALIA International DX Convention 2007

The 2007 International DX Convention will take place **April 27, 28 & 29, 2007** at the Holiday Inn Hotel & Conference Center in Visalia, California. This is an ARRL sanctioned convention that is sponsored this year by the Northern California DX Club. It is expected to draw visitors from around the World and will feature programs from recent DX-peditions and contest operations.

The Convention theme this year is, "**Elmering New DXers is Job Number One!**" Accordingly, a portion of the programming will be devoted to helping new DXers learn about how to be noticed in a pile-up, snag a "new one" and get that elusive QSL card.

Other Convention offerings will include: DX, Top Band and Contest Forums, technical talks, many door prizes, both Friday and Saturday evening "attitude adjustments", Saturday Barbecue Lunch, Saturday night banquet, Sunday morning "power" breakfast, Vendors Exhibits and QSL card checking.

Current information and registration forms are available on the Convention web page, which can be found at www.dxconvention.org. Additional registration in-

formation can be obtained by contacting Convention Registration Chairman, Dick Letrich, W6KM via email at: dlw6km@aol.com.

If you're interested in DX or DXing, the Visalia International DX Convention is *the* place to be. We hope to see you there.

George Allen - W6YD

Pictures from the Meeting:

At the January 19th general Meeting the OCARC was honored to have Bob Heil and Chip Margelli of Heil Sound as our guest speakers. Together they put on a presentation worthy of a major Amateur Radio Convention. The presentation included a slide show detailing the history of Heil Sound and Bob's induction into the *Rock and Roll Hall of Fame*.



Bob Heil – K9EID, of Heil Sound, discusses the importance of your microphone having the right response for your transmitted audio stand out. (Photo-W6HHC)



Chip Margelli – K7JA, of Heil Sound, (left) assists Bob with his presentation. (Photo-W6HHC)

Continued on Page 10



Please support the companies that support OCARC



Make sure to thank them for their support of OCARC when you order from them, or when you see them at a convention!

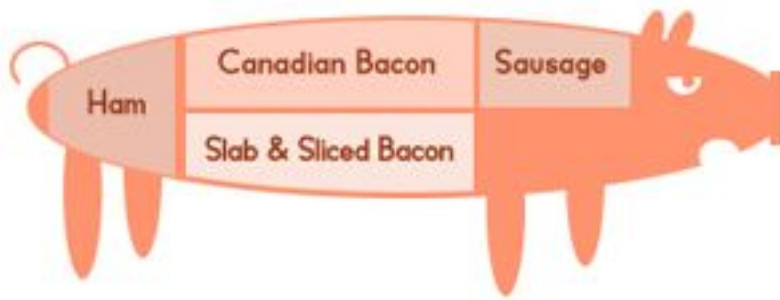


The DX Store
 A Shack on the Belt Free Zone
 Heil - Bird - I.C.E - Inrad - Comet
 Daiwa - Alpha - DCI 

 **FREE PL-259**
 Visit our Web site fo details

Amateur Radio Equipment for DXers!
 sales@dxstore.com
www.dxstore.com





Ham Cuisine

*Dan Dankert - N6PEQ
n6peq@dxer.com*

Italian-Style Ham Subs

Ingredients:

3/4 pound thinly sliced cooked ham
1 loaf French OR Italian bread (about 14 inches long)
2 cups shredded mozzarella cheese (8 ounces)
1 tablespoon olive oil
2 1/2 teaspoons dried basil, crushed
2 teaspoons red wine vinegar
1/4 teaspoon dried rosemary, crushed
1/8 teaspoon ground black pepper

Cooking Directions:

Heat oven to 350 degrees F. Using long serrated knife, cut bread loaf in half lengthwise. Set top half aside. Using spoon, slightly hollow out bottom half, discarding bread scraps. Sprinkle 1 cup mozzarella cheese over bottom half. Layer ham on top of cheese. Combine olive oil, basil, red wine vinegar, rosemary and pepper in small bowl. Drizzle over ham. Sprinkle with remaining mozzarella cheese. Cover with top bread half. Wrap in foil. Place sandwich on baking sheet. Bake for 25 minutes. Serve immediately. Serves 4 to 6.

W6YDX
Special Event
Station!!!

March 11th, 2007



Celebrate the essence of **Daylight Savings Time** by contacting the Yamon DX Federation “W6YDX” Daylight Saving Time special event station in Tustin, California (DM13). This salute to an exciting tradition will be held on March 11th, 2007 during the hours of 0500z and 1300z. Anticipated SSB operating frequencies will be 3.850 MHz, 7.250 MHz & 14.250 MHz. CW will be on 7.040 MHz. Other possible frequencies include 50.135 MHz SSB, 144.210 MHz SSB & 146.550 MHz FM.

A special commemorative full-color photo QSL card will be issued for this event! We look forward to working you on March 11th!

One lucky QSL recipient will receive a clock as a gift!

Please send QSL requests to:

The Yamon DX Federation
c/o Dan Dankert N6PEQ
13672 Fairmont Way
Tustin, CA 92780-1811 USA

Please also include a SASE

For more information, please contact the Yamon DX Federation via email at w6ydx@yamon.org or visit us on the web at <http://www.yamon.org>

We will be reachable via email during the event.

Don't forget to set your clocks forward one hour on this special night!

FEBRUARY BOARD MEETING MINUTES:

The OCARC Board meeting was held at the Jägeraus Restaurant at 8 AM on Saturday, 2007-02-03. There were a total of 14 members and visitors. There was a quorum present with only director Dan-K6PEQ absent (at work).

Director Reports:

- **Programs** – Carl Gardenias WU6D, our ARRL Orange section manager, will speak at the February meeting. Mick Stwertnik KB6JVT of NCG Company (Comet Antennas, etc.) will speak at March meeting. April Moell WA6OPS of the Hospital Disaster Support Communications System is the speaker for April (but, of course!)
- **Treasurer** – Bob-AF6C reported that the OCARC has \$3,940 in the bank.
- **Membership** – Steve-N1AB reported that the club currently has 62 members, but only about 50% have paid-up for 2007. The grace period ends March 31.
- **Publicity** – Rich-KE6WWK again ask the board to consider using pens, pads, and other “giveaways” containing OCARC info to increase club awareness.

Old Business:

- **Newsletter Editors** – The current line up for “rotating editors” is:
 - Feb – Bob-AF6C
 - Mar – Nicholas-KI6AUL
 - Apr – Kristin-K6PEQ
 - May – Ken-W6HHC
- **Field Day** - Willie-N8WP announced there would be a visit to the 2007 Field Site right after the club breakfast to survey locations for stations and antennas. There was also discussion to plan for a larger food budget since several local hams have elected to participate with OCARC at FD this year. Finally, Willie explained that we should plan to rent a flat-bed truck this year to simplify FD logistics (around \$300).

New Business:

- **Baker-to-Vegas** – Rich-KE6WWK announced that the B2V race would be conducted the weekend of April 21-22. The city of Orange RACES, COAR, is looking for operators to set-up and to provide communications during the race. If interested, contact Rich at: ke6wwk@arrl.net

Good of the Club:

- **75th Anniversary** – Bob-AF6C reminded the board that the 75th birthday of the OCARC will occur in 2008. This can provide the club with many opportunities such as special-event-station, special call letters, club reunion, etc.

Submitted by Ken W6HHC – Secretary



JANUARY GENERAL BOARD MEETING MINUTES:

The OCARC General meeting was held at the **Red Cross** complex in Santa Ana at 7 PM on Friday evening, January 19th. There were a total of 46 members and visitors in attendance. There was a quorum at the meeting with all ten of the club directors present.

Program:

The January program was presented by **Bob Heil – K9EID** and **Chip Margelli – K7JA** on equipment produced by Heil Sound. Bob-K9EID, who has been inducted into the *Rock and Roll Hall of Fame*, showed a slide show that included how ham radio helped him troubleshoot audio equipment for singing groups and later led him to design audio equipment that exceeded their expectations.

OLD Business:

Ken-W6HHC reported that the audit committee had successfully audited the club’s finances for 2006. The OCARC had a total of \$3,455 in the bank at the end of 2006. [Note: The full audit report appears in this issue of RF.]

New Business:

Willie-N8WP announced there would be a visit to the 2007 Field Site right after the next club breakfast (Saturday Feb 03) to survey locations for stations and antennas. The club plans to hold field day at the Los Alamitos JFTB base this year again.

Good of the Club:

Janet-KL7MF displayed a complete QRP station with a Yaesu FT-817 rig in a Pelican carrying case.

Submitted by Ken W6HHC – Secretary



MEETING PICTURES: *Continued from page 6*



Chip and Bob show two special PR-20 microphone models including a pink one supporting the Susan G. Koman Breast Cancer Foundation. (Photo W6GMU)



Orange County Amateur Radio Club - W6ZE

12/31/06

Financial Report for 2006

Receipts:

ARRL BPL	
ARRL Membership Income	\$115.00
Auction In	676.00
Badge Income	42.00
Badge Mailing	3.00
Christmas Dinner Tickets	1,035.00
Donations - Misc	2.00
Dues Family	70.00
Dues Future	60.00
Dues, Membership	747.00
Field Day Shirts	342.76
Interest	5.44
Kei Yamachika Trust	300.00
Christmas Raffle	1,522.00
Raffle Reg Income	1,276.00

Total Receipts: \$6,196.20

Disbursements:

ARRL BPL	
ARRL Membership Expense	\$85.00
Auction Out	495.00
Awards & Plaques	59.27
Badges Expense	91.37
Bank Service Charges	14.00
Brochure Printing Expense	58.90
Christmas Dinner	1,021.95
Coffee Mugs	
Donations O.C. Fair	50.00
Donations Newslite	50.00
Equipment Expense	731.99
Field Day Food	368.26
Field Day Other	505.40
Field Day Shirts	456.86
Insurance	322.00
Corporation Legal Fees	20.00
OCARC Brochures	
PO Box Rental	40.00
Program Speaker Expense	
Raffle Expense	1,208.70
Christmas Raffle	397.99
Christmas Raffle, Women's	84.43
Refreshments	34.51
RF Printing Expense	
Supplies	32.35
Trailer Expense	
Web Page Exp	119.88
World Radio AD	65.00

Total Disbursements: \$6,312.86

Net (\$116.66)

Cash - Beginning Balance - January 1, 2006

Checking Account	\$2,795.50
Savings Account	\$772.75

Cash - Beginning Balance **\$3,568.25**

Cash - Ending Balance - December 31, 2006

Checking Account	\$2,677.00
Savings Account	\$778.19

Cash Ending Balance **\$3,455.19**

Outstanding Checks:

#709 Ken Konechy (10/20/2006) \$3.60

Beginning Balance: **3,568.25**
Plus Net for Year **(\$116.66)**
Plus Outstanding for year **\$3.60**
Equals Ending Balance: **\$3,455.19**

APPROVED BY:

L. Dargatz

Loran Dargatz, KD6LRD
Audit Committee

K. Konechy

Ken Konechy, W6HHC
Audit Committee

C. Peloquin

Cheryl Peloquin, KG6KTT
Outgoing Treasurer

R. Eckweiler

Bob Eckweiler, AF6C
Incoming Treasurer

Signed copy is on file with the Treasurer.





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>

ORANGE COUNTY AMATEUR RADIO CLUB, INC
P.O. BOX 3454
TUSTIN, CA 92781-3454

First Class Mail

Time Dated Material.
Please Expedite!!



Next RF Deadline: March 5th