



RF



ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLIV NO. 9

P.O. BOX 3454, TUSTIN, CA 92861-3454

September 2003

The Prez Sez:

As we enter the last few months of the year I will be appointing an election committee. The committee will be looking for candidates to lead the club in 2004. I would like to see some newer and younger members think hard about filling the positions on the Board of Directors. The election will take place in November and new directors will take office in January 2004.

The September meeting will be held at the Orange Police Station, 1107 N. Batavia Street, starting at 1900. Talk in will be on the COAR repeater 446.140 MHz minus with a PL of 94.8 Hz or on 146.550 simplex.

Several club members stated that they want more HAM activities. Make your ideas known, and we can act on them.

We had a great presentation by Bill W1HIJ on having Field Day in Cuba. Two of our members, Dan N6PEQ and XYL Kristin K6PEQ, also made the trip with Bill.

I will be gone the last part of September, so I will see everybody in October for the auction.

73's---Lowell-KQ6JD

When things fail, ham radios step up!!!

Operators help firefighters and police during blackout!

By Stephen Singer
ASSOCIATED PRESS

When technology failed on a massive scale in August, some old-fashioned broadcasting stepped into the breach as ham radio operators took to the airwaves to reach emergency workers.

For millions of people in the Northeast and Midwest, the Aug. 14 outage took access to e-mail and the Internet with it. Landline and cellular telephones were jammed by a crush of calls.

-- See **Blackout** cont'd on page 7

Meeting Warning!!!

September meeting will be held at Orange PD HQ

Program chairman, Steve KB1GZ has announced that the OCARC September 19th meeting will be held at the Orange PD Headquarters on 1107 N. Batavia in the City of Orange. **We will NOT meet at the normal Red Cross building.**

September Meeting

The meeting will be held at the EOC in Orange PD HQ on 1107 N. Batavia (just south of Katella). Talk-in on 446.140 (-) 94.8PL or 146.550 simplex.

The presentation at this meeting will be

"New program called CERT, the Community Emergency Response Team. See the new \$500,000 Emergency Communication Vehicle"

Don't miss it. All members and visitors are welcome.

The next general meeting will be:

**Friday, Sept 19th
@ 7:00 PM**

We will be meeting in EOC Room in the **Orange PD HQ Building**

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**THE ORANGE COUNTY
AMATEUR RADIO CLUB,
INC.**
P.O. Box 3454, Tustin, CA 92781



2003 Board of Directors:

President:

Lowell Burnett, KQ6JD
(714) 997-0999
LBur729028@aol.com

Vice President:

Steve Brody, KB1GZ
(714) 974-0338
stevebrody@sbcglobal.net

Secretary:

David Mofford, W7KTS
(714) 285-0693
davidmofford@hotmail.com

Treasurer:

NEW → Stephen Sam, KG6QVY
(714) 997-1047
stevesam@sbcglobal.net

Membership:

Bob Buss, KD6BWH
(714) 534-2995
kd6bwh@aol.com

Activities:

Matt McKenzie, K6LNx
(714) 546-2228
k6lnx@arrl.net

Publicity:

Larry Hoffman, K6LDC
(714) 636-4345
k6ldc@earthlink.net

Technical:

Bob Eckweiler, AF6C
(714) 639-5074
af6c@arrl.net

Members At Large:

Cory Terando, AE6GW
(714) 894-3817
corymuzk@yahoo.com

Frank Smith, WA6VKZ
(714) 356-4695

2003 Club Appointments:

W6ZE Club License Trustee:

Bob Eckweiler, AF6C
(714) 639-5074
af6c@arrl.net

Club Historian:

Bob Evans, WB6IXN
(714) 543-9111
bobev@netzero.net

RF Editor:

Ken Konechy, W6HHC
(714) 744-0217
kkonechy@pacbell.net

WEB Master:

Ken Konechy, W6HHC
(714) 744-0217
kkonechy@pacbell.net

ARRL Assistant Director:

Ken Konechy, W6HHC
(714) 744-0217
kkonechy@pacbell.net

ARRL Awards Appointee:

Larry Beilin, K6VDP
(714) 557-7217
k6vdp@aol.com

OCCARO Delegate:

Bob Buss, KD6BWH
(714) 534-2995
kd6bwh@aol.com

Monthly Events:

General Meeting:

Third Friday of the month
at 7:00 PM
Orange Police HQ
1107 N. Batavia
(1 block south of Katella)
Orange, CA

Club Breakfast:

First Saturday of the month
at 8:00 AM
CowGirl's Cafe, Too
2610 S. Harbor Blvd
(just south of Warner)
Santa Ana, CA

Club Nets (Listen for W6ZE):

7.115 ± MHz CW **OCWN**
Sun- 9:00 AM – 10 AM
Rick KF6UEB, Net Control

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 Dec and 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.

More on VSWR

By Bob Eckweiler – AF6C

(This is part six in a series to explore RF impedance, from the antenna...down the feed line...and eventually reach the antenna tuner and transmitter.)

Is Reflected Energy Lost?

Last month we talked about VSWR and how, when energy reaches the antenna end of the feedline some of it is reflected back unless the antenna impedance perfectly matches the feedline. The perfect match is a condition that is not often met by antennas used over ham band frequencies. What happens to this reflected energy when it reaches the other end of the feedline and encounters either an antenna tuner, a pi-network circuit (found in most older tube transmitters - see sidebar) or a broadband matching transformer (found in most solid-state radios)?

When the energy reflected by the antenna mismatch reaches a properly tuned antenna tuner or pi-network circuit it encounters another large impedance discontinuity and is reflected almost entirely right back up to the antenna. Any energy lost in the tuner or pi-network circuit depends on how well the circuit was designed and adjusted. While normally low, this loss can be high when matching high SWRs, especially if the actual impedance at the tuner is at a very low impedance point. If a broadband matching transformer is encountered instead of an antenna tuner, the situation is different; less energy is reflected and more is dissipated in the transformer and final transistors. In modern transceivers a protection circuit is employed to

reduce the output power of the final transistors to protect them in such a case. This obviously results in a significant reduction in power reaching the antenna, should the mismatch be large. A broadband output network can usually handle as SWR of up to 2.0:1 without excessive losses; above that an antenna tuner is recommended. Read your product's specifications.

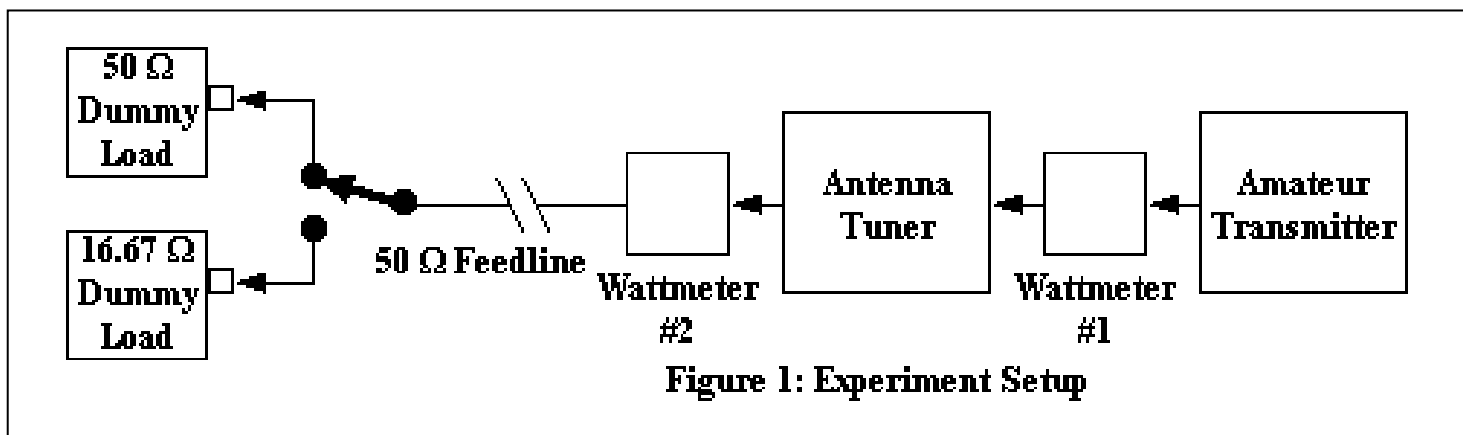
An Experiment:

Look at the setup in figure 1. A transmitter is connected through a directional wattmeter to an antenna tuner; the output of the antenna tuner goes through a second directional wattmeter and along a 50 Ω feedline to a dummy load. This dummy load can be switched between 50 Ω and 16.7 Ω. These products were all bought at *Radio Lair* in *Diagon Alley* and are lossless.

With the dummy load set to 50 Ω and the antenna tuner switched out of the circuit, adjust the transmitter to produce 100 watts. Both meters should read 100 watts of power towards the antenna and zero watts of power towards the transmitter.

Without changing any transmitter adjustments, switch the transmitter to standby. Then switch the dummy load to 16.7 Ω and switch in the antenna tuner. Adjust the antenna tuner so the transmitter again sees a 50 Ω resistive load. With the transmitter on, the wattmeter between the transmitter and antenna tuner should still read 100 watts of power towards the antenna and zero watts of power towards the transmitter (If it doesn't, the antenna tuner is misadjusted).

-- See **TechTalk** cont'd on page 4 --



TechTalk -- cont'd from page 3

Before looking at the other wattmeter, let's think for a second. The mismatch between the 16.7 Ω dummy load and the 50 Ω feedline results in a 3.0 to 1 VSWR. Here are two simple formulas that relate forward and reflected power to SWR:

$$SWR = \frac{1 + \sqrt{\frac{P_R}{P_F}}}{1 - \sqrt{\frac{P_R}{P_F}}} \quad \frac{P_R}{P_F} = \left(\frac{SWR - 1}{SWR + 1} \right)^2$$

EQ #1

EQ#2

Where P_F is the forward power and P_R is the reflected power.

Solving equation 2 using an SWR of 3.0 tells us that 25% of the power is reflected when the SWR is 3.0:1. With that information, you may first guess that the second wattmeter will read 100 watts forward and 25 watts reflected. Then you remember that those 25 watts reflected are sent back up the line when they are again reflected by the antenna tuner, so the meter should read 125 watts forward and 25 watts reflected? You're getting closer, but we know the antenna tuner cannot change the SWR on the feedline to the antenna, and if we try these values in equation one, they can only exist if the SWR is 2.6:1, so this answer is not correct either. Let's look at the second wattmeter; it reads 133 watts forward power and 33 watts reflected power. Plugging these values into equation 1 gives the correct 3.0:1 SWR. Many people are shocked to find that the forward power is greater on the feedline than what the transmitter is actually putting out! No, this isn't "free" power; if you subtract the reflected power from the forward power you'll see that the net for-

ward power is still the original 100 watts. The reflected power is 33 watts and not 25 watts because when the 25 reflected watts reaches the antenna, a quarter of it is also reflected and on and on. After an infinite amount of reflections that reflected power builds to 33.33... watts as shown in Table 1:

Reflection Number	Power Reflected	Sum (Watts)
1	25.000	25.00
2	6.250	31.25
3	1.563	32.81
4	0.391	33.20
5	0.977	33.30
6	0.024	33.33
7	0.006	33.33

Table One – Power After Reflections

This is in a lossless system. You can try this experiment at home. You may need to borrow some wattmeters and dummy loads from a friend (Or conduct the experiment as a group.) Parallel three 50 Ω dummy loads for the 16.7 Ω dummy load. You should still see a forward power greater than the transmitter power if you try this experiment yourself, though feedline and antenna tuner losses will reduce the values to an extent that is determined by your system losses. The important thing to remember is that much the power reflected due to SWR is returned to the antenna. It is not all wasted energy.

Next month we'll finally discuss baluns and what they can do and can't do.

de AF6C

The Pi-Network Circuit:

We've mentioned the pi-network circuit numerous times. Figure 2 (on page 8) shows the basic circuit. It performs a function similar to an antenna tuner except, instead of transforming the impedance of the antenna to 50Ω resistive to match the output of a transmitter, it transforms it to a high impedance (KΩs) to match the plate load the final transmitting tubes want to see for maximum efficiency. The 'Tune' capacitor tunes the circuit to resonance and the 'Load' capacitor adjusts the match. Like an antenna tuner the adjustments are interactive.

OCARC General Meeting Minutes

August 15, 2003

President Lowell, KQ6JD, called the meeting to order at 7:00 PM. [Editor's note: a total of 30 club members and visitors were present.]

Lowell introduced the guest program speaker, Bill Scholz, W1HIJ, who spoke on his Field Day experience in Havana, Cuba.

Business Meeting was called to order, roll was called and all were present except Secretary David Mofford, W7KTS, a quorum was established.

President Lowell appointed a committee to audit the books as we have a new Treasurer. Tom, WA6PFA, is to be chairman, assisted by Carl, WA6BSV, and Stephen, KG6QVY.

There will be no board meeting in September, the weekend conflicts with Hamcon in Long Beach. The Next General Meeting will be held at the Orange Police Department.

Vice President Steve, KB1GZ, introduces the topic for September's meeting, Orange P.D. Dispatch & Emergency Preparedness, 1107 N. Batavia St., south of Katella Ave. Talk-in 446.140 - PL94.8, 1900 hours.

The Minutes from the July General meeting were not approved as published. A misunderstanding between Phil, N7PA, and Lowell, KQ6JD, led Lowell to believe that Frank, WA6VKZ, had resigned from the Board -of-Directors when in fact he had only resigned from the By-laws committee.

MOTION: Reverse election of Cindy, KC6OPI, at July General meeting, to take the place of Frank, WA6VKZ, as Member at Large. Frank is, and always has been, on the board for the 2003 term. Made by Bob, KD6BWH, seconded by Jim, AE6UC. Passed unanimously. Minutes were then approved as amended.

Treasurer's Report:

We have \$2300.00, in the treasury (combined accounts), and one new member.

Publicity Report:

Chairman Larry, K6LDC, would like to publicize the upcoming auction, or do away with it. We need to e-mail people for lists of equipment and commitment. Bob, KD6BWH, to put an ad out on the OCCARO reflector. Larry, K6LDC, to make flyers for O.C. clubs.

Old Business:

Bob, AF6C, States that we have "Powerpole" Anderson connectors left over for sale or as a contribution to the raffle. No interest shown for red/black wire for power leads.

New Business:

Vice President Steve, KB1GZ, is looking for a place for the Christmas dinner.

Ken, W6HHC, addresses the club with his proposed amendments to the by-laws. [Editor's note: these four proposed amendments are reprinted on page 9.]

Phil, N7PA, addresses membership with his proposed complete rewrite of the by-laws. Bob, AF6C, suggests that the new proposed by-laws be fully discussed by the Board -of-Directors, one article at a time, then brought to the membership and discussed one article at a time, read, then voted upon. Phil states that the Board -of -Directors was presented with the proposed by-laws for review and suggestions by June 7, 2003. He received suggestions from all but Bob, AF6C, and amended the draft. Phil, N7PA, grants Bob, AF6C, 30 days to make changes to his proposal and re-submit them. MOTION: The Board-of-Directors shall resolve the by-laws/constitutional issues and bring it back to the Membership. Made by Bob, WB6IXN, Seconded by Larry, K6LDC, passed unanimously.

Good of Club:

John Ramsey of the Red Cross has taken a job in Anchorage, AK. August 15, 2003 was his last day at the Santa Ana EOC.

KFI, 640AM, tour available 8/30/2003, \$20/person, tour, food, etc., first 75 people. Contact Bob, KD6BWH for details.

Chino High School has Swapmeet, contact Bob, KD6BWH for details.

Motion to adjourn made at 9:51PM, by Jim, AE6UC, Seconded by Larry, K6LDC.

Respectfully submitted,

Cory Terando, AE6GW, on behalf of David Mofford, W7KTS

OCARC Sept BOARD MINUTES

The normal September OCARC Board meeting was cancelled because of the conflict with the ARRL Convention in Long Beach.

OCARC Financial Audit Report

approved by

Tom - WA6PFA, Carl - WA6BSV, and Stephen - KG6QVY

OCARC

Statement of Receipts and Disbursements with Cash Balances
For the Six months ended June 30, 2003

Receipts

Auction In	\$0.00
Badge Income	9.00
BADGE MAILING	2.00
Donation - W6NGO Trust Fund	0.00
Donations - Misc	0.00
Dues, Family	120.00
Dues, Membership	640.00
Laminating Lic	0.00
Interest Income	9.22
Raffle Reg Income	172.00
Refresh. Income	0.00

Total Receipts

\$952.22

On Aug. 21, 2003

Disbursements

Auction Expense	\$0.00
Badges Expense	0.00
Donation - News Line Exp	0.00
Donation - Other	0.00
Donation - OC Fair	0.00
Field Day Food	150.00
Field Day Other	3.00
Flowers Expense	0.00
Insurance Expense	0.00
Miscellaneous Expense	21.00
Plaques	0.00
PO Box Rental	38.00
Program Speaker Expense	18.88
Raffle Expense	179.85
Refreshments Expense	0.00
RF Postage Expense	37.00
RF Printing Expense	28.45
Supplies	0.00
Web Hosting	95.00
World Radio	65.00

Total Disbursements

636.18

NET

\$316.04

Cash Beginning Balance - January 1, 2003

Cash Savings	\$25.00	
Checking Account	2,095.08	
Cash - Beginning Balance		2,120.08

Cash Ending Balance - June 30, 2003

Checking Account	926.90	
Savings	1,509.22	
Cash - Ending Balance		\$2,436.12



the Annual W6ZE Ham Radio Auction

Presented by the Orange County Amateur Radio Club, W6ZE

Friday Eve. October 17, 2003

**Auction begins
at 7:00 PM
Sharp**

**The auction will be held at the American Red Cross
Building, 601 N. Golden Circle Drive in Santa Ana.**

***For complete details &* some of what will
be auctioned, or to list what you will bring
to sell, see our website at W6ZE.org or
phone Lowell 714-997-0999 or Larry 714-557-7217**



You need not be a member to buy or sell.

**Let's make it a good one. Turn your junk into
someone else's treasure and into your cash.**

**Let your cash turn someone's junk into your
treasure.**

Blackouts -- cont'd from page 1

But the ham radio, which came into being in the World War I era, connected firefighters and police departments, Red Cross workers and other emergency personnel during the most extensive blackout in the Northeast since 1977.

Ham operators are not dependent on a server or cell tower, and with battery backups can operate when grids can't.

"When everything else fails, the ham radio is still there," said Allen Pitts, a ham operator in New Britain. "You can't knock out that system."

The radios are operated by a network of volunteers organized by the Newington-based American Radio Relay League.

Ham radio's importance won renewed recognition after the Sept. 11, 2001, attacks. ARRL won

a federal Homeland Security grant of nearly \$182,000 to train amateur radio operators in emergency operations to help during terrorist attacks.

"It's incredible the differences you're seeing, the large cadre of people who know what they're doing," Pitts said. "It's making a major difference."

Tom Carrubba, a coordinator for ARRL in New York City's five boroughs and two counties on Long Island, said volunteers went to work immediately after power went down Thursday afternoon.

"In five minutes guys were on the air with the Red Cross and Office of Emergency Management," he said

ORANGE COUNTY AMATEUR RADIO CLUB

ANNUAL ACTION Friday, OCT 17, 2003

Auction rules

The OCARC Annual Auction will take place on Friday evening, October 17th, 2003, at 7:00 PM at the American Red Cross facility located at 601 N. Golden Circle Drive, Santa Ana (see map below). 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 the OCARC.
- 7) A special table will be set up for donated items. The proceeds of donated items will go to the OCARC.

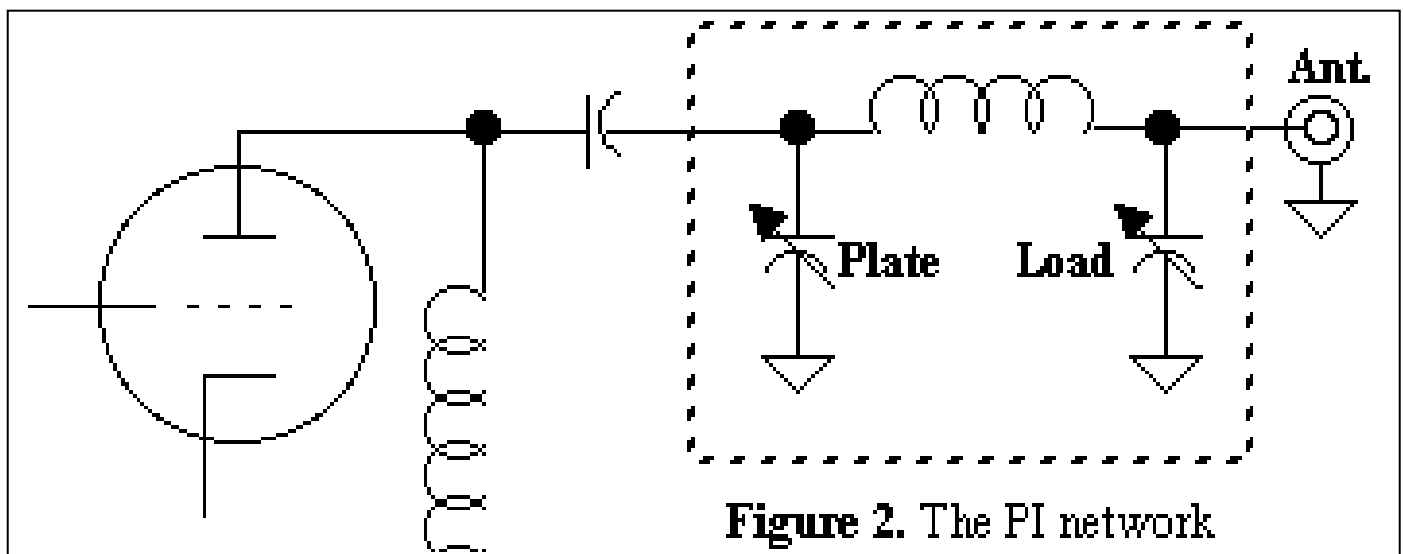


Figure 2. The PI network

Proposed Set of Four Bylaw Changes

The four changes below are being proposed to the Bylaws of the Orange County Amateur Radio Club.

Item 1) Article VI – D.1 DUAL CHECK SIGNATURES

Is: Checks for \$100 or less may bear the signature of the treasurer alone. Checks for higher amounts must also bear the signature of the president or the vice president.

Proposed: Checks for \$250 or less or for normal expenses [Note: “normal expenses” are expenses that tend recur from year to year] may bear one authorized signature. Checks for donations or over \$250, that are not for normal expenses, shall have either the approval of the board or shall have the approval of the club membership at a general meeting.

Item 2) Article II - B. REMOVAL OF AMOUNT OF DUES FROM BYLAWS

Is: [Amended 1999 to read:]
1. Dues are raised to \$20/year, for members 20 years of age or older.
2. Dues for members 19 years or younger, will become 50% of base rate.]

Proposed: The base rate amount of yearly dues shall be determined by the board of the directors for the coming year, no later than the November board meeting preceding the beginning of the coming year. If no action is taken by the board, then the base rate will not change in the coming year.

1. Dues for members 20 years of age or older, are 100% of base rate.
2. Dues for members 19 years or younger, are 50% of base rate.

Item 3) Article II - C. and Article VI – D – 3 ELIMINATE OCARC MEMBERSHIP CARDS

Is: Each member after admission shall receive a membership card and a dues receipt signed by the treasurer.

Proposed: Each member after admission shall receive a dues receipt signed by the treasurer. ...also in Article IV.... Issue dues receipts as required.

Item 4) Article I – D CLARIFICATION

Is: To participate in all types of activities involving amateur radio.

Proposed: To participate in activities involving or for amateur radio.

These proposed amendments were presented at the August General Meeting. The proposed changes will be presented again at the September general meeting and then put to a vote during the meeting. In order to change the OCARC Bylaws, a two-thirds affirmative vote of the membership present at the meeting is required.



OCARC “MARS Party” was lots of fun!! On Tuesday evening, August 26, Bob Evans – WB6IXN organized a gathering for club members. Telescope on left is Bob’s-WB6IXN. Telescope on right is David’s-W7KTS

**Amateur Radio
vs
Broadband over Power Lines (BoPL)**

If you think the term "Broadband over Power Lines" and its acronym BoPL (or BPL) will never affect you, guess again. BoPL could effectively spell the end of ham radio as we know it. This, if it is approved by the FCC and popularized across our nation.

And just how real is this challenge to the survival of the Amateur Radio Service? ARRL Southwestern Division Director Art Goddard, W6XD, gave some graphic details at the recent Fort Tuthill Hamfest in Arizona based on data collected by Ed Hare, W1RFI, of the ARRL Lab.

If you are an engineer, you will see anywhere from 33-to-63 dB increase in the noise level that you will see at your receiver due to BoPL run in power lines in your neighborhood. If you are looking at S-Meter readings, that's somewhere between S-6 and 10 dB over S-9.

For the unaware, Broadband over Power Lines is a scheme to provide consumers and businesses high speed Internet connection using the existing power distribution grid. The problem is that power lines are not shielded. They will act as much like giant antennas as they will a closed carrier of the broadband connection.

In other words, whatever RF signals are on the power lines will be radiated and heard by your ham radio receiver. And Art Goddard says that Broadband over Power Line signals will occupy the spectrum from 2 MHz through 80 MHz, meaning that every ham band from 80 Meters through 6 Meters will be affected.

Art Goddard indicated that the ARRL may soon be asking Amateur Radio operators to lend their voice on opposition to BoPL.

Reprinted portions from ARNewsline

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

First Class Mail

***Time Dated Material.
Please Expedite!!***