RF

ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. XLIV NO. 11 P.O. BOX 3454, TUSTIN, CA 92861-3454 November 2003

The Prez Sez:

The auction was a success, thanks to the work and organization of: Larry K6LDC, Larry K6VDP, Ken W6HHC and Stephen KG6QVY. We raised about $136, this means we can have an auction next year. We has a good turn out and it was nice to see faces that have been absent, for a while.

November is Election month and we need another large turn out, of the membership. If you feel you would like to hold a position, on the Board of Directors, call (**714 774-6361**) or send an Email, to Bud WA6VPP, let him know what you would like to do.

The OCARC Christmas dinner will be, December 14 at Marie Calendars, 540N. Euclid Street, Anaheim (Just south of HRO) starting at 1700. Steve KB1GZ will need to know a head count and Menu selection by the next club meeting November 21.

The RF needs a new editor for next year. Ken has informed me that he needs a break and more time for his business. He will work with the new editor for a couple of issues so they can transition smoothly.

73's----Lowell-KQ6JD

OCARC WEB SITE TOPS 20,000 VISITORS

During the month of October the OCARC WEB SITE at WWW.W6ZE.ORG tracked another 460 visitors to push us over 20,000 recorded visits since May of 1998.

According to a survey by SEVENtwentyfour, Inc. the OCARC hit the TOP 20 in these engines:

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You're # 1 on All The Web
You're # 4 on AOL
You're # 2 on HotBot
You're # 1 on Lycos
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OCARC Looking for New Editor for 2004 --- Ken W6HHC is Retiring

After two years in his most recent gig as editor of the RF Newsletter, Ken W6HHC is retiring from those duties at the end of the year.

If you would like to serve as editor for a year or so, please contact Lowell, KQ6JD or anyone on the board. Ken has offered to help the new editor get started for a month or two.

November Meeting

The program this month will be by Sue Guilford, N6OWT on:

"Sailing the Pacific with HAM Radio"

See her slides and hear her talk about beautiful French Polynesia. Also you may learn how badly the word pacific applies to the Pacific Ocean, but please take note that this speaker is not for those who fear water!

Also OCARC elections will be held to choose officers for 2004.

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

The next general meeting will be:

Friday, Nov 21st
@ 7:00 PM

We will be meeting in Anaheim Room in the **east Red Cross B**uilding

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THE ORANGE COUNTY AMATEUR RADIO CLUB, INC.
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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.

Tech Talk #35

More on Baluns and Noise Bridge

By Bob Eckweiler – AF6C

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

W2DU Balun:

One of the baluns that we discussed last month was the very effective W2DU current balun. Here are some practical tips on their construction. The ferrite beads most commonly used in the HF range (80 through 10 meters) are the Amidon FB-73-2401 or equivalent. The 73 refers to the ferrite material (mix #73, μ of 3000). The 2401 is an arbitrary reference to the size of the bead. These beads measure: 0.380" OD, 0.197" ID, by 0.190" L, see Figure 1. The HF balun is made by slipping 50 of these beads (9 1/2 inches total length) over about a foot long piece of coax. One end of the coax can have a connector of your choice and the other end wire leads to attach to the antenna. Appropriate weather protection is required. A VHF balun (for 6 through 1.25 meters) is made similarly except using 25 Amidon FB-43-2401 (or equivalent) beads (μ of 850). For low power RG-58 (0.195 dia.) can be used as the coaxial cable; it fits snugly through the bead hole. For higher power, RG-303 is recommended. Though actually thinner than RG-58 (0.170 dia.), the Mil. Spec. RG–303 is easily capable of handling more than double the legal amateur power. Since you're only using a foot of it, the losses are negligible. If you insist on using RG-8 sized coax you can use 11 or 12 FB-77-1024 beads. These beads measure 1.020-in. OD, 0.500-in. ID, 0.825-in. L; and are considerably more expensive.

Palomar Engineering advertises W2DU type balun kits for RG-8 and RG-58/59/62 cables. The kit includes beads and a piece of shrink tubing to hold the beads in place and provide weather protection. I don't have specifications on these baluns, but they appear to be #43 material and only 5 1/2" in effective length. (I believe it uses five each Palomar FB-102 _– equivalent to Amidon FD-43-1020 – beads) I'm doubtful that they will provide results as good as the baluns above; however, they may still do an adequate job.

[See the Balun Resource List on the last page of RF for more information.]

The RX Noise Bridge:

In numerous past TechTalk articles we've talked about antenna and feed line impedance, and perhaps you've wondered how to measure these impedances. Impedance measuring, for the most part, used to be done in labs with multi kilobuck test equipment. With today's microprocessors, handheld impedance measuring devices are suddenly available at prices hams can afford.

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

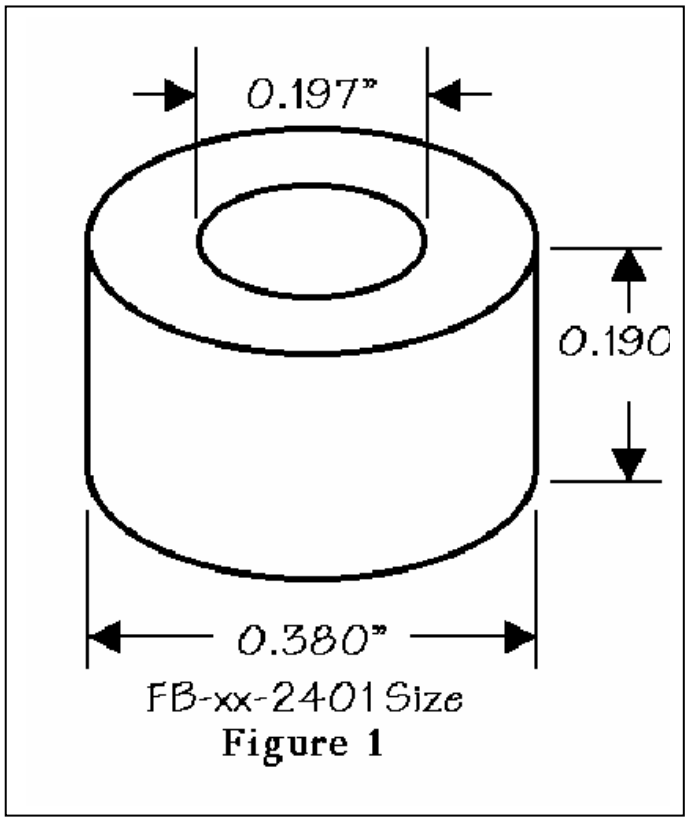


Figure 1

TechTalk -- cont'd from page 3

However, there is one piece of equipment that has been around for a long time that can measure impedance with reasonable accuracy and is inexpensive; that device is the RX Noise Bridge.

To understand the RX noise bridge you must first understand the basic bridge circuit. Figure 2 is a schematic of a typical bridge circuit. A signal of known frequency is applied to the primary of a transformer with two identical secondaries. The secondaries are wired as a bridge with four legs: the two transformer secondaries, Z Unknown (The impedance to be measured) and Z Adjustable (An adjustable and known impedance.) The adjustable impedance normally has two controls, one for resistance "R" and one for reactance "X". The reactance control is usually center zero and is marked with inductance in one direction and capacitance in the other. A sensitive RF detector is connected as shown. As long as the two impedances are different, RF from the signal source appears at the detector. However, when the adjustable impedance is equal to the unknown impedance, the bridge is balanced and no RF reaches the detector. The known resistance and inductance or capacitance can then be read from the dials, the inductance or capacitance converted to reactance using the frequency of the signal source and the impedance R±jX determined. Let's say we want to measure an impedance at 10 MHz. We set the signal source frequency to 10 MHz and adjust the bridge for minimum signal on the detector. The bridge balances with R reading 88 ohms and X reading 159 pF. First we must determine the reactance of 159 pF at 10 MHz;

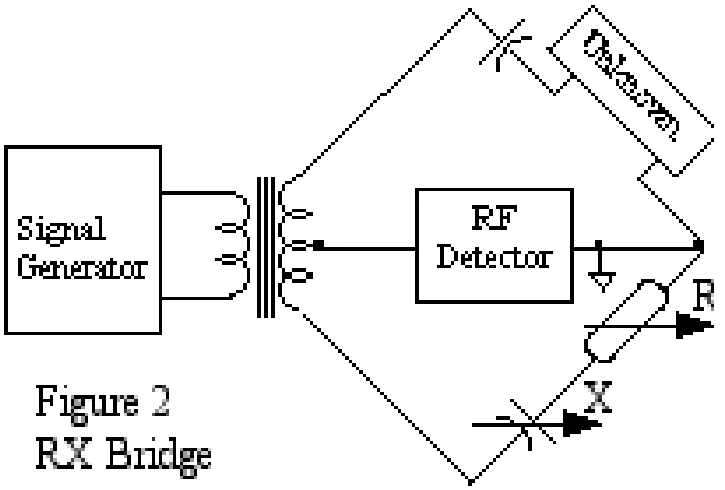


Figure 2
RX Bridge

From your General or Technician Class written test you remember:

$$X_C = \frac{1}{2\pi fC}$$

$$X_C = \frac{1}{2 \times 3.14 \times \left(10 \times 10^6\right) \times \left(159 \times 10^{-12}\right)}$$

$$X_C = \frac{10^6}{10{,}000} = 100\Omega$$

Thus the measured impedance at the at the bridge is 88–j100Ω (remember capacitive reactance is negative!) If the other end of the coax is attached to the antenna you can now transform the impedance you've just measured to the other end of the coax using either the Smith Chart or a calculator. The ARRL Antenna book has the formulas and a good section on using Smith Charts.

Well, I promised you a cheap way to measure impedances, but so far I haven't delivered. Stable signal generators and RF detectors are high priced lab equipment not found in most ham shacks. Fortunately there is a solution. Let's replace the accurate generator that you must set to the desired frequency of measurement with a noise generator. All that's needed is a circuit that generates strong white noise containing all frequencies from 1 MHz up to 100 MHz or so. This circuit (once the secret of every electrical power company) is simple and very inexpensive to build.

Now all you need is a detector that must be frequency selective, have a signal strength meter, be very stable, and have an accurate frequency readout. This piece of equipment is also expensive; luckily you probably already own one; it's your receiver or the receiver part of your transceiver. The receiver must cover the frequencies you want to measure impedances at; this is not a problem as most ham radio transceivers/receivers now-a-days have general coverage receive. (If you're going to use a transceiver, be sure not to transmit into the RX noise bridge!)

-- See **TechTalk** cont'd on page 7 –

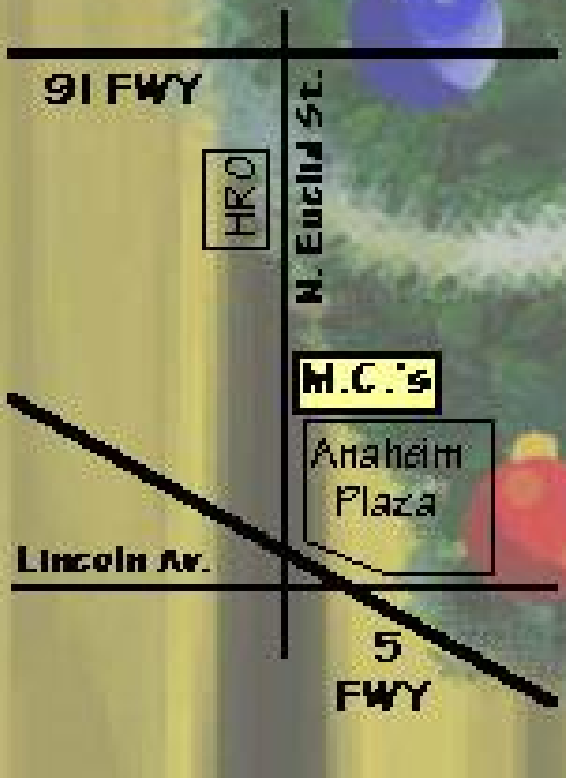
The Annual O.C.A.R.C.

Christmas Dinner

SUNDAY December 14th, 2003
5:00 PM - 8:00 PM

Marie Callender's Restaurant
540 N. Euclid St.,
Anaheim, CA (714) 774-1832

For more information, the menu, or to RSVP
contact: Steve Brody, KB1GZ, (714) 974-0338
stevegbrody@msn.com



de AF6C

2003 OCARC Holiday Dinner

OCARC dinner plans are set for Sunday, December 14, 2003 at 5:00pm at the Marie Callender's Restaurant, 540 N. Euclid Avenue in Anaheim (714-774-1832). It is just south of the HRO (Ham Radio Outlet) store. Take the I-5 freeway North to the Euclid exit, make a right turn onto Euclid and at Cresent make another right turn. The restaurant will be on the right.

Immediately after the November club meeting we will need to do two things:

1. Tell them the number of people coming.

2. We will need to determine which Dinner Option we will choose - as a group. So, I guess we will vote. Option 1, 2 and 3 dinners are $13.99 per person, option 4, 5, and 6 dinners are $15.99 each person.

The Tuscany Trio listed below consists of: Lasagna, Chicken Parmesan and Fettuccine Alfredo.

Option #1 ***Lemon Chicken Dinner or Four Cheese & Meat Lasagna or Pot Roast Dinner***

Option #2 ***Pot Roast Dinner, or Roasted Turkey Dinner or Four Cheese & Meat Lasagna***

Option #3 ***Pot Roast Dinner, or Roasted Turkey Dinner or Meat Loaf Dinner***

Option #4 ***Tuscany Trio or Artichoke Mushroom Chicken or Fresh Lemon-Pepper Salmon***

Option #5 ***Ginger Teriyaki Mushroom Top Sirloin or Artichoke Mushroom Chicken or Fresh Lemon-Pepper Salmon***

Option #6 ***Artichoke Mushroom Chicken or Tuscany Trio or Ginger Teriyaki Mushroom Top Sirloin.***

* * * * * * * * * * * * * * *

We have to decide which one of the above Menu Options the OCARC will use.

So far, the most votes have come in for Menu Option #5

Option #5 provides you the ability to order either beef, chicken, or fish.

Send in your vote by e-mail to Steve Brody KB1GZ at stevebrody@sbcglobal.net

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To use the RX noise bridge all you do is attach the unknown impedance to the "unknown" connector on the bridge and your receiver to the "receiver" connector. Tune your receiver to the frequency at which you'd like to make the measurement. Now, turn on the RX noise bridge and you'll be greeted with an S9+ noise level on your receiver. Using the S-meter, alternately adjust the "R" and "X" knobs on the noise bridge for minimum noise. You should reach a sharp null where the S meter approaches zero. At this point, use the "R" and "X" readings as described above to determine the impedance at the point of measurement.

Commercial noise bridges have been produced by MFJ, Palomar and Heathkit to name a few. They are also easy to make. The February 1977 issue of ***Ham Radio*** describes construction of an inexpensive RX noise bridge. It was written by W6BXI and W6KNU. W6BXI is a former resident of Orange, CA and a guest speaker at one of our club meetings many years ago. He discussed construction of the RX noise bridge, and I still have his notes and the original article if anyone would like a copy.

What Else?

You might wonder what else you can do with an RX noise bridge. Here are some uses. We'll discuss them further in a future TechTalk:

- Measure SWR.
- Determine the length of a feedline.
- Measure the loss of a length of feedline.
- Determine the nominal impedance of a feedline.
- Determine the velocity factor of a known length coax.
- Adjust your antenna tuner off the air.
- Evaluate Amplifier pi-networks.

Next month I'll introduce the Smith Chart. This handy tool does more than I could ever discuss in this column. However, I'll try to give you an introduction so you can follow the excellent Smith Chart chapter found in many editions of the ARRL Antenna Book.

de AF6C

OCARC Board Meeting Minutes

November 1, 2003

The November Board Meeting of the Orange County Amateur Radio Club was held at the Cowgirls Too Restaurant. The meeting was called to order at 8:30am by Pres Lowell KQ6JD. Roll call revealed there was a quorum with the following absent: Steve KG6QVY; Matt K6LNX, Cory AE6GW, Frank WA6VKZ. A total of 12 members and visitors were present.

Old Business:
Auction had a $136 estimated income.

The four proposed changes in bylaws will be voted on at the November General Meeting.

The Nominating Committee will be contacting candidates for 2004 officer positions.

The OCARC Christmas Dinner will be held at the Marie Callender's Restaurant near the HRO store in Anaheim on Sunday, Dec 14.

New Business:
The Not-So-DX-pedition that had been planned for this fall will not be held.

Good of the Club:
Bob AF6C will put together a Certificate of Appreciation to be presented to Cowgirls Cafe, Too in appreciation for the use of the space for board meetings and low prices.

The OCARC's donation of $103.00 to the ARRL 's BPL fund was mentioned in QST;.

Ken W6HHC has sent a list to the ARRL of updated zip codes that we wish to be used in when we receive the names of new hams.

Bob AF6C expressed an interest in possibly trying something resembling Ham in the Park trying possible antennas.

There being no further business, the meeting adjourned at 8:55am.

Respectfully Submitted

David Mofford W7KTS - Secretary

A Report from Frank WA6VKZ

As you may know, Frank Smith – WA6VKZ, a long-time member of OCARC and a current board member, has been visiting and recuperating with his daughter's family up north in Portland, OR since summer.

I had an opportunity to talk with Frank by phone last week and Frank sends his best wishes to the club. He reports that his back pain has been getting better. He was delighted to hear about the success of the recent OCARC auction. When I spoke with him, he had just finished getting the VHF/UHF antenna up in the air with the help of his son-in-law. The next phase was to erect a 10M dipole antenna for the low-bands.

Frank also reported that he is leaning towards returning to Tustin before spring time.

…de Ken W6HHC

W2DU Balun Resource List

Fully manufactured W2DU baluns by:
Unadilla
The Wireman, Inc.

W2DU Balun Kits by:
The Wireman, Inc.
Palomar Engineering

Ferrite Beads from:
Amidon:
FB-73-2401 or FB-43-2401 $4.50/dozen
FB-43-1020 $2.00 each
FB-77-1024 $2.50 each

The Wireman:
FB-73-2401 or FB-43-2401 $0.25 each*

Palomar Engineering:
FB-24-77 or FB-24-43 $4.85 dozen
(replaces: FB-73-2401 or FB-43-2401)
FB-56-43 $1.65 each
FB-102-43 $3.30 each

Coaxial Cable from:
The Wireman:
RG-303 $1.24 per ft.
* Quantity discounts available.

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

First Class Mail

Time Dated Material.
Please Expedite!!