

New Bern Amateur Radio Club



foto by W2RLG & W2HVX

Volume 33, Issue 1, January, 2010



Logo tnx to Eve, XYL of W2HVX

W4EWN/R

146.610/ 146.010 PL 100 Hz.
444.900 / 449.900 PL 100 Hz.

Website: <http://www.nbarc.org>

Next Meeting -- Thursday, Jan. 7, 2010

6:20 PM at The Courtyards at Berne Village, 2701 Amhurst Blvd.

Program: The Kilgore Rangerettes have been too busy recently and send their regrets

Treasurer's report for December 2009

Members' dues are trickling in and have been deposited as they've come in. If you plan to pay by cash, please (in small letters) put your call sign on the bill so I can be sure the proper credit is given and a receipt will be issued. Checks will serve as a receipt.

Club equipment has increased almost double for this past year, mostly because of donated equipment plus the purchase of a spare repeater. The club was paying \$189 per year for equipment insurance that was on hand. The insurance on the additional equipment amounted to \$111.69. The newest club assets, approved by club vote, were increased by an estimated \$8,000, --from \$12,000 to \$20,000. Replacement cost estimates were determined by consultation with Bob Melle, Sid Purvis, and Al Parker. It was also determined that the ARRL (MARSH) equipment insurance was unable to cover the communication trailer

The present bank balances stand at:
Savings - \$2461.90 - - - and Checking - \$428.25.
Ray Hemphill, W7OPH, Treasurer

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NBARC's fiscal year is Jan 01/Dec. 31. Our \$20.00 per year membership dues has remained constant for many years. You may pay Ray, **W7OPH**, at the meeting, or if you wish to renew via P.O. mail, the address is:

1508 Kimberly Road, New Bern, NC 28562

Meeting Report

The Christmas Party was attended by 11 YI's and 20 Om's and a great time was had by all. Rob Thompson, AA2UX, provided entertainment on the keyboard with some Christmas selections. Chef Bruce out did himself with a delicious creamy potato soup, the best I've had in a very long time. If you didn't take notice before, he always has a second entrée on the menu. I can say we sure got lucky when Howard KG4MBD and Al W8UT suggested we look into this opportunity. A loud voice YES vote rang out and was called to continue meetings at the CourtYards.

73, Ed, W2YPM

Editor's note: Due to circumstances beyond control, such as information coming in late, or not coming, or getting lost in the process, the format of this month's newsletter will, of necessity, be a "rough & ragged" edition. Computer (and other) woes have been rampant again at **W8UT**, use of the laptop computer has become necessary for your fumble-fingered editor. You may have to "do it yourself", provide your own formatting, pic captions, etc. Thanks to Jim, **KS4O**, for pix. Apologies to those whom I may have missed

SKYWARN Appreciation Day at NWS Newport

The 11th annual SKYWARN Recognition Day was held at NWS Newport (MHX) from 7pm Friday, December 4th through 7 pm Saturday, December 5th, 2009. Coordination of the event this year was again handled by Meteorologist Hal Austin, NC4HA. It was a windy and rainy weekend, but Hal managed to get a great turnout.

This was the first year that the MHX amateur station **WX4MHX** was on the air for the full 24 hours. And for the first time, there was participation by ham clubs from all six counties in the MHX district:

- Pamlico Amateur Radio Society
- Carteret County Amateur Radio Society
- Onslow Amateur Radio Club
- Kinston Amateur Radio Society
- Brightleaf Amateur Radio Club
- New Bern Amateur Radio Club

The Carteret and Pamlico clubs operated the **WX4MHX** station, Onslow ARS operated HF and PSK31 from portable stations in the office conference room, and NBARC operated HF and VHF from our communications trailer parked next to the MHX office. According to Hal, a total of 31 NWS offices were contacted, 5 of them on PSK31.

Our "Certified Grillmaster" Bill Sanford, **K4VHO**, a regular at this event for the last few years, was absent this year. However, MHX Electronics Technician Jon Petry and Meteorologist John Cole cooked some great hamburgers and hot dogs. A bit of adventure was added when the smoke from the grilling set off the building smoke alarm. [See the photos of the group in front of the building is awaiting the "all clear" signal to return to their lunch.]

Tours of the new operations area were available all day. The layout appears to be a big improvement over the old one. In particular, the amateur station **WX4MHX** is essentially just another workstation in the heart of the operations, rather than being off by

itself as it was before this redesign. I think this is an indication of the value that the weather bureau puts on SKYWARN.

Special thanks go to Bob Melle, **KJ4HJH**, who towed our communications trailer to the NWS Newport on Friday, made almost all of the contacts there on Saturday, and brought the trailer back home on Saturday night. Our President Dave Warwick, **K4DJW**, followed Bob too, on Friday night, and helped him with the setup. Bob even made coffee and brought donuts for members and visitors!

73, Jim, **KS4O**, EC

And, please note the following letter of appreciation--

Good Morning Everyone,

Skywarn Recognition Day 2009 was a huge success, and it's all due to you and the participants from your clubs. Thank you so very much! This was the first year in my five years of doing this here at NWS Newport that we had representation from all five clubs in our forecast area! Ron Civils KC4WVV from the Kinston club operated for most of the 24 hours. Incredible!

I hope your visit was fun and informative, and you'll want to come back next year. I'll do my best to order up sunny skies, I promise! Also, we'll move the grill so we don't set off the smoke alarm!

I know I didn't get everyone's e-mail address that came yesterday, so if you would please, the next time you see them please give 'em a pat on the back and pass along my thanks.

We made a total of 31 contacts of NWS offices. Pittsburgh had two stations going with two different callsigns, so I'm not sure if the total is really 30 or 31. Five contacts were made on PSK31 by the Onslow ARC (great job and cool setup, Jerry & Co!). Attached is a Word file with the list of all the NWS stations contacted for your enjoyment.

Lost & found: someone left an ARRL 2009-2010 Repeater Directory in the conference room. From the Onslow ARC perhaps? If you know who it belongs to, please give me their name and address and I'll make sure it gets to them.

A very Merry Christmas to all of you, and happy and healthy New Year!

73!

Hal Austin, **NC4HA/WX4MHX**
NWS Newport/Morehead City

P.S. Remember, beginning January 1, 2010 the NWS criteria for severe hail goes from 3/4" to 1"! (Wind criteria stays the same).



Bob, **KJ4HJH**, in the NBARC Comm Trailer

Hal Austin, **NC4HA**, at the new workstation



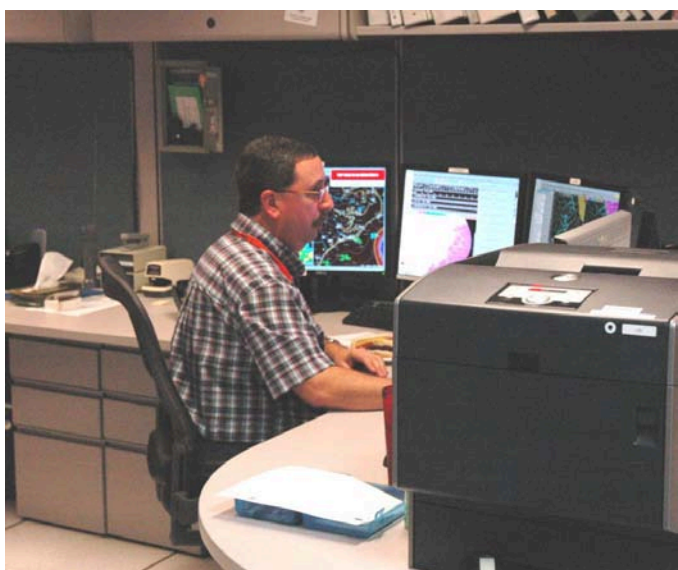
Jamie King, **KJ4JK**, operating **WX4MXH**



NBARC Comm Trailer outside the Weather Center



New MHX operations - **WX4MXH** on right



MHX operations including station **WX4MXH**

KS4O pix

IMPEDANCE Part II ANTENNA IMPEDANCE

W4ULD 12-10-09

In Part I we discussed some of the important aspects of impedance in AC circuits.

Most Hams will mainly encounter AC impedance in feeding antennas. An antenna like any circuit involving AC currents will have an impedance.

Every antenna is an inductance and capacitance in series with a resistance as depicted in Figure 1.

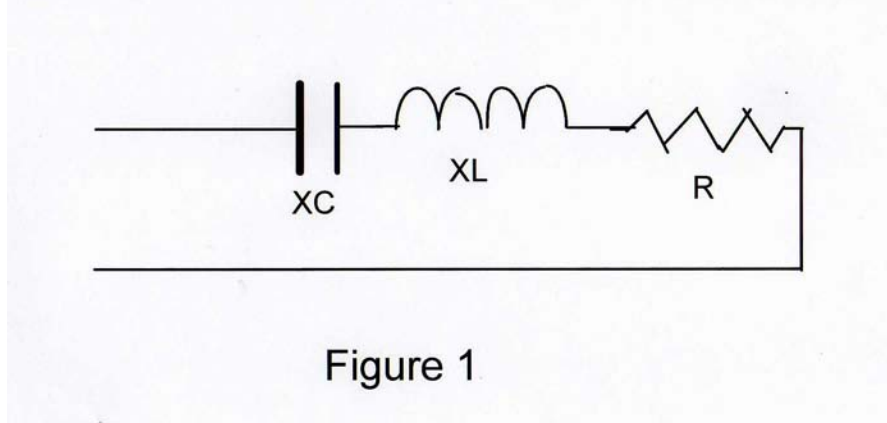


Figure 1

No matter where the antenna is fed, there will be an XC, XL, and R.

If the antenna is resonant at the operating frequency and the impedance is measured at a current maximum, XC and XL will be equal leaving R as the input impedance. This R minus wire loss is known as the radiation resistance. R and radiation resistance are practically the same value. The power dissipated in this resistance is the only power radiated by the antenna. Resonance may be achieved by lengthening or shortening the antenna (dipole length in feet will be approximately $468/F$, where F=frequency in MHz.) or by canceling the X of the impedance by installing an X of the same value as the X of the impedance but of opposite sign. Thus the 135 ft. antenna described in the next paragraph at 3.9 MHz. may be resonated by installing a capacitance ($X=-218.4$) in series with and close to the feed point. In such a case the radiation resistance will be 54.3 ohms minus a small copper wire loss.

Most Hams use some form of horizontal wire fed in the center for an antenna. Any horizontal wire will have an input impedance depending upon where it is fed. For example, a 135 ft. long wire fed in the center will have an input impedance of $54.3 + j218.4$ on 3.9 MHz. If this antenna is fed about 22.7 percent from one end, it will have an input impedance of $209.6 + j 635.3$. These two impedances are the ones that must be matched to the RF source for the maximum transfer of power. The feedline, assumed to be 60 ft. of CQ-552 ladder line (loss = $\frac{1}{2}$ in. hardline, $Z_0=374$, $v_f=0.91$) will transpose the antenna impedance in the first case to $130.2 - j 517.3$. The transposed impedance for the off-center fed case will be $64.9 - j165.9$. These are the impedances which must be matched to the 50 ohm transceiver for maximum transfer of power. Matching is usually accomplished with an antenna tuner. Most of the loss in such a setup is in the feed line. If ladder line or open wire line is used, the loss will be relatively small; however, if coax is used (except hard line) the losses will be substantial. The Smith Chart or a Smith Chart computer program is used to calculate the impedances at the input end of the feedline. In the off-center fed case, a balun will be required where the ladder line connects to the antenna to prevent the ladder line from radiating. If the input to the feedline is matched to 50 ohms, The antenna will also be matched.

As explained above the R value of 54.3 ohms except for a small wire loss and if the X of the impedance is cancelled by a series capacitor is known as the radiation resistance. Thus the radiation resistance is defined as the resistance at a current maximum without any losses applied. No matter where the antenna is fed, the current flowing in the radiation resistance creates the only power radiated by the antenna. Thus, if the transceiver puts out 100W, and the antenna tuner and feedline are loss less, 100W will be delivered into a 54.3 ohm load giving a current in the 54.3 resistance of:

$$P = I^2 R$$

$$I = \sqrt{\frac{100}{54.3}} = 1.357 A$$

As stated above, only the power dissipated in R will be radiated no matter where the antenna is fed.

This situation causes some confusion in feeding vertical antennas which are considerably taller than ¼ wavelength when they are grounded. The radiation resistance of a base fed grounded ¼ WL vertical (Fed at a current maximum or at ground) is generally considered to be about 33 ohms. However, when taller than ¼ WL the input R at the base goes up rapidly. Since the ground resistance is a function of the number of radials, it is easy to assume that the efficiency of a ½ WL antenna goes up dramatically since the antenna impedance goes up while the ground resistance does not change. However, one must consider that the radiation resistance of a ½ WL grounded vertical is about 70 ohms. The efficiency of a ½ WL over radials is almost twice that of a ¼ WL vertical; however, it is nowhere near the improvement one would expect from the increase in R. Thus the antenna efficiency in percent is:

$$Effic. = \frac{RadiationR}{groundR + otherLosses + RadiationR} \times 100$$

When the antenna is resonate at the operating frequency, XL and XC cancel leaving only R. As the frequency increases, XL increases and XC decreases, and visa versa. R is the part of the impedance that absorbs power from the transceiver and radiates from the antenna. The important thing to remember is that the radiation from any antenna is highly dependant on the power received. The power received is highly dependent on the loss in the feedline. Thus it is important to employ the most loss less feed line available for the application. This will usually be hardline or ladderline. Any type of coax(except hardline) is very poor in most applications.

-- an unsolicited testimonial --

Sent: Monday, December 21, 2009 7:00 PM

Al,

Thank you very much for posting the antennas I had for sale in the New Bern Amateur Radio Club newsletter and website.

The club newsletter and website are read by many more hams than you would think and I wanted to let you know.

The R7 went to a ham in Chicago, the AR-6 to one in California, and the 13B2 to one in Roanoke Rapids.

Only one antenna is still for sale:

Diamond X510MA 2m/70 cm Dual Band High Performance Vertical, \$105

The reason I have not renewed my membership in the club is because I transferred my Lions Club membership to the Twin Rivers Lions Club and they meet at exactly the same time as the Radio Club. I still have my radios, have one two-meter set up, and my license is current, but I haven't transmitted for quite some time.

Thanks again,

Jim Dugan, **W1JFD**

New Bern

jfd@duganotero.com

Cast of Characters for 2010:

President: Dave Warwick, K4DJW

Vice President: Ed Valentine, W2YPM

Secretary: Bob Melle, KJ4HJH

Treasurer: Ray Hemphill, W7OPH

Emergency Communications: Jim Wright, KS4O

Assistant Em. Comm.: Mark Rappaport, W2EAG

Public Svc/Special Events/VEC: Bruce Arnold, N8UTY

Repeater Trustee: Sid Purvis, WA4VBC

Program Committee Chairman: Kermit The Grouch

Photography: Mac Eutsler, WA0ZGL

The Newsletter Team:

Al Parker, W8UT, Editor, Ray Hemphill, W7OPH, mailings

The NBARC Newsletter is the newsletter of the New Bern Amateur Radio Club, Inc., 1508 Kimberly Road, New Bern, NC 28562. NBARC is an affiliated club with the ARRL and ARES.

Material contained herein may be quoted, copied, folded, torn, spindled, mutilated, etc., as long as proper credit is given. Any inquiries, comments, items for Swap Shop, suggestions, contributions, and letters for inclusion should be sent to the Editor, W8UT, at e-mail: anchor@EC.RR.COM

Selected Local Nets Times are local time, unless otherwise stated

Craven County ARES: 146.61 MHz, 2000 before threatening wx; monitor during ARES activations

NC ARES Net, 3.923 MHz, 19:30 daily

Waterway Radio Cruising Club: 7268 kHz, 0745 daily

Fairfield Harbor Cruising Net, 7224, 0730 M-F

NC Morning Net: 3927 kHz, 0745 daily

Carolina Slow Net (CW): 3695 kHz, at 8PM ET (5wpm) daily

Coastal Carolina Emergency Net: 3908 kHz, 1900 daily

Tarheel Emergency Net: 3923 kHz, 1930 daily

Carolinas Net (CW): 3573 kHz, 1900 (20 WPM), 2200 (10 WPM) daily

Carteret County ARS/ARES: 145.45 mHz, 1930 Tues./ Emerg

Traffic handling 1st Tues. after 4th Sat., monthly SKYWARN: 145.21 mHz, 2100 Tuesdays

Pamlico County ARES: 147.210 MHz, tone 151.4, 1930 Wed.

ENC Emergency: 146.685 mHz, 2100 Thursdays

ENC Traffic: 146.685 mHz, 2030 daily

NBARC Ragchew: 146.61 mHz, 2000 daily

New Bern Amateur Radio Club

<http://www.nbarc.org>

1508 Kimberly Road, New Bern, NC