New Bern Amateur Radio Club

foto by W2RLG & W2HVX

Volume 32, Issue 12, December, 2009

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, December 3, 2009

6:20 PM at The Courtyards at Berne Village, 2701 Amhurst Blvd. see below for directions

Program: Our 3 Dec. meeting is our annual Christmas party. We will have a gift exchange. Guys bring a guy gift, gals bring a gal gift. $10.00 is the suggested amount. Dinner will be served, make your reservations by Mon. noon, Nov. 30.

FINANCIAL REPORT

There is $2,462.10 in the savings account. There is $583.10 in the checking account. We have about a dozen that have already paid dues for 2010. Their receipts will be available at the meeting.
Ray Hemphill, **W7OPH,** Treasurer

Our Meeting Place

We will meet at the Bern Village Court Yards dining room for the December 3rd meeting. Directions are as follows:

1) From HWY 70 west, take the Glenburnie Rd. exit, then turn right onto Glenburnie Road.
2) Take the next right onto Amhurst Road (Next to the Fuel Warehouse).
3) Follow Amhurst Road about 200 yards and take the 2nd entrance to the Court Yards.
4) Enter the building with the fountain in front and the protected walkway into the building.

President's Corner

The Dec 3, 2009 meeting will be at the Bern Village Courtyard Dining Room, located on Amhurst Road, which is off Glenburnie Road. The menu will be sent out as soon as we get it from Chef Bruce Thomas. Dinner will be served at 6:30 PM. It will be the standard Christmas meeting, no program, just a $10 gift exchange and a nice dinner. Please let Bob Melle know by noon Mon., Nov. 30, if you plan to attend so he can get a head count and relay the number to Chef Bruce. You can reach Bob at bmelle@yahoo.com or by fone at 633-6596.

The Club Auction will be moved back to after the 1st of the new year sometime. That will give us more time to gather all our valuable electronic equipment that we want to get rid of.

I would like to thank Pete Koonce, **KA4SXX,** for his many years of service as the Club Vice President and Billy Morton, **KE4YMA,** for his years of service as the Repeater Trustee. I am sure they have their reasons for wanting to step down from these jobs, but I understand after doing the same job for many years a person may want a change. Both have been an asset to the club and deserve a "job well done".

On the same note I would like to thank Ed Valentine, **W2YPM,** for taking the position of Vice President and Sid Purvis, **WA4VBC,** for taking the Repeater Trustee position. Ed has contributed to the club in many ways in the past, the latest being sharing his interest and offering advice in 2 meter SSB operation with the club. He as a lot to offer the club and I am glad to have him as the Vice President. Sid has donated many years of service and costly parts toward the Repeater service and upkeep. I think he is the most knowledgeable person in the club about the repeater and is the perfect person for the job. Thanks guys for volunteering!

For those who can make it to the Christmas Meeting I will see you there. For those who cannot make it to the meeting, I hope you have a safe and joyful holiday!

73's Dave, **K4DJW**

Minutes of Meeting

NEW BERN AMATEUR RADIO CLUB

5 November 2009

The regular monthly meeting of the New Bern Amateur Radio Club was held this date and the meeting was called to order at 7:00 by President Dave Warwick, **K4DJW**. There were 38 names on the roster, one of which is attached to these minutes. Introductions were made from the floor with name, call sign, and bands normally operated.

Ed Valentine, **W2YPM,** announced that this coming Monday and Tuesday should be good UHF propagation. Ed also passed out list of interesting sites for Technical SSB and antenna information. Thanks Ed.

Sid Purvis, **WA4VBC**, brought up that the repeater site really needs a load of marl to patch up the entrance. It is in very bad shape and is getting hard for the members maintaining the site to get in to it. If anyone has access to some let us know.

Dave, **K4DJW**, thanked the election committee which consisted of Bruce Arnold, **N8UTY**, Bill Ash, **N2GAH**, and Bill Reasons, **KI4TDY**. And the nominations were, President Dave Warwick, **K4DJW**, Vice President, Ed Valentine, **W2YPM**, Secretary, Bob Melle, **KJ4HJH**, Treasurer, Ray Hemphill, **W7OPH**, Trustee, Sid Purvis, **WA4VBC**, and CO/EC Jim Wright, **KS4O**. Motion to elect by Bob Gregory, **WB1CCY**, 2nd by Mark Rappaport, **W2EAG**. Motion carried.

Dave,**K4DJW**, gave a short presentation on GPS and the many functions that are available with them. Our 3 December meeting will be at Bern Village and is our annual Christmas party. We will have a gift exchange. Guys bring a guy gift, gals bring a gal gift. $10.00 is the suggested amount. Hope to see you all then.

Robert Melle, **KJ4HJH**, Secretary

WHAT IS MY ERP?

By Sid Purvis – **WA4VBC**

As hams when we speak of our ham station transmitting or communicating capability, we usually state it in terms of our transmitter output power. That is fine, but a better way to express it may in terms of Effective Radiated Power (ERP). The amount of power leaving the transmitter gives us a "feel" for our capability, but what is most important is how much power is leaving the antenna and in what direction. Also, we need to consider what our effective receiver sensitivity is. Andy, **W4ULD**, has written many fine articles on antenna patterns and gain so we will leave that in his department. Ed, **W2YPM**, also gave some good antenna info in has recent 2 meter SSB club presentation. I was thinking about ERP the other day when looking at a commercial license renewal, as it is required to calculate the ERP when submitting the application. In most of the FCC documents and regulations we can find a lot of references to ERP as it equally as important to them and the end-user as the transmitter power. So let's refresh our memory on how to calculate our ERP.

Let's consider a case where we have a typical 50 watt VHF transceiver operating at 144 MHz. To calculate the ERP we need to know the system gains and system losses in Db. If we assume a 50 foot run of RG-58 coax to a 3 Db omni gain external antenna, we would have the following: Losses = coax loss of 3.4 Db, connector losses = .25 Db and if we have a SWR meter or jumpers in line, figure a loss of .5 Db. So we have a total loss of 4.15 Db. Our gain would be 3 Db (antenna). The net loss/gain would be the difference and amounts to a loss of 1.15 Db or -1.15 Db. Recall that the formula for Db is Db= 10 log (p1/p2). Convert that to find our ERP and we get Power (P) in ERP = P in (anti-log of system gain or loss/10), if I recall my math correctly. Considering we started with 50 watts out of the transmitter we would have an ERP = to 50(anti-log -1.15/10 for an ERP of 38.37 watts... Note that in the popular RG-58 coax; 30.77 watts are lost in the coax and connectors with only 19.23 watts reaching the antenna. The 3 Db gain takes it to 38.37 watts ERP. Now if we invest in better coax let's see the result. If we use RG 8X, we would lose 24.94Db in the coax, get 25.06 Db to the antenna and have an ERP of 50.00 watts. If we go one up one more notch and invest in RG-8 we would wind up with 17.72 Db loss in the coax and connectors, 32.28 Db on the antenna for an ERP of 64.41 watts or about 1.67 times better than originally.

Now, let's say we get real serious and go with a set-up where we have a 2 meter station with a 150 watt transmitter, LMR-400 coax, and a 15 Db gain directional antenna. We would have losses of 0.75 Db in misc. loss

and 0.75 in the coax for a total of 1.5 Db loss. We would have a gain of 15 Db in the antenna for an overall system gain of 13.5 Db. We now have only 14.6 watts lost getting to the antenna and are putting 35.4 watts on the antenna. But now, we have a whopping 1119.45 ERP and really cooking.

Note the figures above are "matched" figures since they assume a perfect coax and antenna match. If any real world SWR is factored in the gains would be less. As indicated, since logarithms are involved, small reductions in losses or small increases in gains make a significant difference.

73, Sid

ARES Angle - Looking Back at 2009 and Forward to 2010

We've had a good year. We've been lucky. No hurricanes to speak of. Not even a named storm on the Atlantic Coast. I do hope you all enjoyed the low stress, because it might not be so pleasant next year.

It's good that we tend to remember the good and forget the bad. But let's not forget to the extent that we think things like "It can't happen to us" or "It can't happen again." We CAN have a disaster that has a major impact on New Bern, Craven County, and adjoining counties... and the citizens of all may need our help. So let's do what we can to be ready.

One significant contribution we can all make, whether ARES participants or not, is SKYWARN. The National Weather Service does have a lot of high technology available, including sophisticated mathematical models running on supercomputers. But that fact is that the NWS still wants and needs observers on the ground. Those observers form the SKYWARN network. Many if not most SKYWARN observers are hams, and all are important. Consequently, once a year, the NWS sponsors SKYWARN Appreciation Day at all the local NWS offices across the country.

Our local NWS office is in Newport. And YOU are invited to come to SKYWARN Appreciation Day on Saturday, December 5. Actually, the "day" is a 24-hour period from 1900 EST on Friday to 1900 EST on Saturday, but the majority of attendees come during the day on Saturday. Bob Melle (KJ4HJH) will tow our Communications Trailer to the NWS site on Friday night. It will be there most of the day Saturday. I hope many of you will come and use both our radios and NWS's radios to make contacts to other SKYWARN Day participants. There will be at least three other clubs from adjacent counties in attendance, and we can take this opportunity to show them our Comm Trailer and see what toys they might bring to show us. I assume that Bill Sanford (K4VHO) will be there cooking another delicious lunch for all of us.

We talked at a recent meeting about possibly having an ARES net. Since that time both Bob Melle and I have observed that the SKYWARN net on Tuesday night at 2100 seems to have died. I suggest rather than starting another net that we help "resurrect" that Tuesday evening SKYWARN training net. It's on the Trenton repeater, 146.310 with a 82.5 Hz tone. The appropriate net script is the Training Net Script located at http://www.mhxSKYWARN.org/trainingPreamble.php. If no one else starts the net, feel free to start it yourself. It's good practice for all of us. I think this is a better solution that starting another net, at least for now. This net is important, and it concerns me that it has temporarily disappeared.

I hope to see all of you at SKYWARN Appreciation Day!

73 de Jim, **KS4O**
Craven County ARES EC

Swap Shop

For Sale: Ameritron AL80A HF Amplifier in very nice condition. It was just completely overhauled, many new parts, and is ready to go. It has a 3-500Z tube and I have a spare Eimac for it. I am selling it to upgrade to a newer amp. $675.00 takes it. The two tubes are worth almost $400.00.
Mark, **W2EAG,** 636-2269 cwman@suddenlink.net

Hamfests

There are no 'fests in our area in Dec., but the season gets started early, not too far away:

Jan. 9, 2010, Winston-Salem FirstFest

Feb. 6, 2010, Richmond Frostfest

THE 43 FOOT VERTICAL 0N 75m AND 160m

W4ULD, 11-21-2009

QST magazine is usually very technically correct and complete in their technical articles. However, in my opinion they really fouled up with the article by Phil Salas, **AD5X**, in the December 2009 issue. I haven't decided how to respond to QST. This article describes a method of feeding a 43 ft. high vertical on the low end of 160M and 80M. The article does a good job of describing a method of feeding the ground mounted vertical but does not mention the details of the antenna or the limitations of a ground mounted vertical on 160M and 80M.

As I have stated before, I am not a fan of ground mounted verticals for the low amateur bands with a small number of radials because of their low efficiency. The minimum number of radials for a ground mounted vertical is four having a length equal to the height of the antenna. A common practice is to use 12 radials; however with 12 radials the ground resistance is about 27 ohms. This value and other losses must be added to the input impedance and reduce the efficiency of the antenna. Approximately 128 radials are required to reduce the ground resistance to almost zero. This is the number of radials recommended by the commercial AM broadcast industry for their ¼ wavelength tall towers.

The grounded, base loaded vertical is fed very close to the intersection of the vertical and the radials attached to the vertical section. In base loading, a loading coil is placed above the feed point. This coil cancels the capacitive reactance of the antenna and is in series with the feed point. Both ground resistance and coil resistance are also in series with the feed point. Both resistances reduce the efficiency of the antenna and add to the R component of the input impedance. Base loading is considered to be inefficient. Thus, mobile verticals are usually loaded just above the center of the antenna for improved efficiency.

Using **EZNEC +4** program I was able to confirm the reactance values reported by AD5X. Also his choice of a T-400A-2 toroid was also a good choice. This is an Amidon iron powder core with a permeability of 10. This large core should be good for the maximum Ham power limit. The AL value for this core is 360 as used in the following equation:

$$N = 100\sqrt{\frac{L}{360}}$$

N = Number of turns required
L = Required inductance, Uh

$$L = \frac{X}{2pF}$$

L = inductance required to cancel capacitive reactance of the feed point
X=inductive reactance required to cancel the capacitive reactance of the feed point.

AD5X used the core as a conventional transformer. It is not a unun as mentioned in the article. A unun is an unbalanced to unbalanced transmission line transformer. The transformer used in the article is a conventional toroid transformer.

The matching technique used by **AD5X** is as old as the hills. First one cancels the capacitive reactance of the input impedance with a series inductance having the same X as the feed point but of opposite sign. Then one taps up on the inductance from the ground end until a 50 ohm match occurs. The number of taps above ground will depend primarily on the number of radials employed. As the number of radials is increased, fewer taps above ground will be required. The actual number of taps must be determined experimentally for the particular antenna and number of radials; therefore, it would be wise to provide taps on each turn for half the total turns. The modern 2M 5/8 WL antenna is a base loaded system and the loading coil is tapped up from ground to achieve a 50 ohm match.

The antenna model I used with **EZNEC** consisted of a 2-in dia. x 43 ft. long vertical divided into two wires. The bottom wire was 1 ft. long and fed at the center. The second wire was 42 ft long. **EZNEC** does not permit grounding wires; so as recommended the radials were placed 1/400 wavelength above ground. The bottom of the antenna joined the center of the radials. In all cases conservative segmentation was used.

AD5X designed his system for the low or CW ends of the 80 and 160M bands. Using **EZNEC+4**, I calculated some data for 1.9 and 3.9 MHz. which most hams are likely to use. My data is shown in Table I. The capacitive reactance to be cancelled to resonate the antenna is the j portion of the impedance.

Note that the efficiency is quite low except with 128 radials on 3.9 MHz.. With 128 radials the ground resistance is close to zero; so the total load is the resistance of the coil which is assumed to have a Q of 150. The efficiency was calculated from:

$$Effic.(\%) = \frac{RR}{RR + GR + CR} \times 100$$

RR= Radiation resistance (presumed to be the input R without the other loads (This is not shown in Table I)

GR = Ground resistance for the number of radials (data I have collected over the years.)

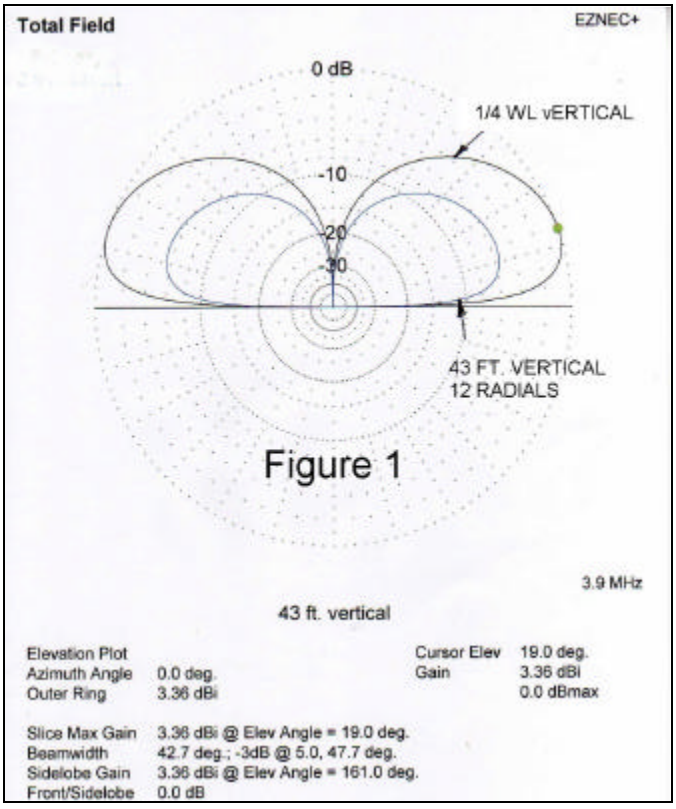
CR=Coil resistance from X/Q=X/150

TABLE1

EFFICIENCY OF 43 FT. VERTICAL

FREQ. MHz.	Number Radials	Total Load, ohms	Ground Resistance	Antenna Efficiency,%	Input Impedance
1.9	4	43.15	40	3.9	44.11 - j472.5
9	12	30.06	27	5.6	31.86 - j458.8
1.9	128	2.8	0	40.9	4.74 - j429.2
3.9	4	41.06	40	19.8	51.22 - j159.4
3.9	12	28.05	27	28.0	38.98 - j157.2
3.9	128	0.926	0	82.5	12.36 - j138.9

Figure 1 further depicts the low efficiency of a 43 ft. tall vertical with 12 radials on 3.9 MHz. vs. a full sized 3.9 MHz. vertical with 128 radials.



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Long Time Members

We haven't seen these folks at meetings for a while, but they're still members, and still thought of often.

Bob, in his Mercury in the early 1950's, Hal in his airplane in 2001, and Charlie in his Riviera in 2002.

Bob, **W2HVX/M** ca 1954

(cont. next page)

73, Andy, **W4ULD**

Long Time Members

Hal, **W2RLG/M**, 2001, in the air over New Bern

Charlie, **K4VC/M**, 2002

W2HVX pix

FCC Looks to Revise, Clarify Vanity Call Sign Rules from ARRL website

On Wednesday, November 25, the FCC issued a *Notice of Proposed Rule Making* (*NPRM*) -- WT Docket No. 09-209 -- seeking to amend the Commission's Amateur Radio Service rules to clarify certain rules and codify existing procedures governing the vanity call sign system, as well as revise certain rules applicable to club stations.

According to the FCC, almost 80,000 licensees have replaced their sequentially issued Amateur Radio call signs with a vanity call sign since the program began in 1996. When the program began, the Commission established what they called "the broad outlines" of the vanity call sign system, concluding that call signs generally should not be available for reassignment for two years following the death of a licensee, or expiration or termination of the license for that call sign. In doing so, the Commission made exceptions for former holders of the call sign, close relatives of a deceased former holder and club stations of which a deceased former holder was a member.

The Commission did not, however, specify all of the procedures governing the vanity call sign system, but indicated that the procedures "would be set out in the *Public Notices* announcing 'starting gates' for the groups receiving initial priority and that the procedures would be adjusted from gate to gate as experience dictated." The procedures announced in the *Public Notices* announcing the gates are still in effect, but they are not set forth in the Commission's Rules. The *NPRM* states that the FCC "now believe[s] that certain provisions should be codified in our rules, and others added, so that the vanity call sign system will be fair, equitable and transparent to all amateur service licensees. The Commission also decided in the *Vanity Report and Order* [issued in 1996] to resume issuing new club station licenses. We believe that certain rule changes to the club station licensing rules may be appropriate."

In the *NPRM*, the FCC proposes to amend their rules to reflect existing procedures to the vanity call sign program. In addition, Amateur Radio clubs would be limited to only one vanity call sign; clubs that currently hold more than one call sign will not be able to obtain any more call signs, but will be able to renew or modify their existing station grants.

The comment period for WT Docket No. 09-209 will extend for 60 days after it is published in the *Federal Register*. Historically, items appear in the *Federal Register* approximately 7-10 days after they appear on the FCC Web site. Reply comments can be made up to 75 days after publication in the *Federal Register*. Read more here:

http://www.arrl.org/news/stories/2009/11/25/11220/?nc=1

Cast of Characters for 2009:
President: Dave Warwick, K4DJW
Vice President: Pete Koonce, KA4SXX
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: Billy Morton, KE4YMA
Program Committee Chairman: The Tooth Fairy
Photography: Mac Eutsler, WA0ZGL

Selected Local Nets Times are local time, unless otherwise stated
Club Net Manager: position open
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

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The Newsletter Team:
Al Parker, W8UT, Editor, Ray Hemphill, W7OPH, mailings
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