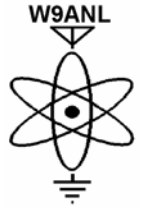


RADIOACTIVITIES

NEWSLETTER OF THE ARGONNE AMATEUR RADIO CLUB



Volume XLVIII, Number 9

September 2007

Club Meeting

Unless otherwise noted, AARC general meetings are the second Tuesday of the month at the Argonne cafeteria at a table on the north end of the room. Any club member is welcome. To arrange for a gate pass contact Bruce Epperson at epperson@aps.anl.gov phone 630-252-3495 or Chuck Doose at doose@aps.anl.gov phone 630-252-6037.

The Treasurer's Report

by Chuck KB9UMF

Members: East 18; Associate 40; Newsletter 6;
Retired 13
Balances: Checking \$3,603.87; Cash \$0.00; ANL fund \$30.00
Distributed as: Club \$2,971.99; Repeater \$594.88, Newsline \$37.00
For the period April 1, 2007 thru July 31, 2007:
Income: Dues \$55.00; Club \$30.00; Rptr \$20.00; Newsline \$5.00; ANL \$0.00
Expenses: Club \$161.85; Rptr \$0.00; Newsline \$0.00

REMINDERS

CLUB BREAKFAST: Always the 2nd Saturday of each month, 8:30 AM at:

Old♦Country Buffet♦

59th Street and LaGrange Road in LaGrange

CLUB NETS: Thru our Club Repeater 145.19.

SKYWARN NET: Mondays in season
at 7 PM with Deni, W9DS.

THE CLUB'S 9PM NET: every Monday with
Jack WA9FVP.

THE NIGHT PATROL: every night at 10:30 PM
with Paul, W9FNM.

THE BREAKFAST CLUB: every morning at 8 AM.

THE NOONTIME NET: every weekday at noon.

Mil's Corner for September

02	AA9N	Clarence	Yorkville, IL
15	KB9CTJ	Loren	Minooka, IL
12	N9FPQ	Raymond	Lemont, IL

7 Foot Loop for 40 Meters

by Deni W9DS

W0PJG, J. Malone, operates a loop in his apartment. And from his trailer sports a 23 foot circumference aerial made of aluminum which is 0.7 wavelengths. The aerial uses a single capacitor. The aerial is 19 strands of aluminum wire each strand 1/16 inch in diameter it was raised to vertical 8 inches off concrete floor indoors the setting of the capacitor in series with the aerial is critical and critical is the aerial length and, thus, small variations of length and capacitance can be made to match 50 ohm transmission lines to adjust the capacitor for lowest SWR as you QSY. SWR is 1.1 from 7.1 to 7.2 MHz.

The transmission line should see pure resistive load, so, lock in the length. Height above ground should be best ¼ wave. The voltage across the capacitor must have high reactance and 100 watts fed into loop will produce 800 volts peak across the capacitor. A RF level of 2kw PEP generates 3600 volts upon capacitor plates. The loop to radiate must have ½ inch diameter for 40 meters. Ground heating of small loops causes losses, even ¾ inches in loop diameter.

The loop can radiate vertically and radiates as well as would a vertical dipole and when horizontal it will radiate horizontal polarization if the plane of the loop is parallel to the ground at a quarter wave above earth, but best ⅝ wave high. The length of the loop and series capacitances of the loop must be adjusted for optimum match to the feed line with aerial at the optimum height and orientation.

A helical short dipole ten feet long can be made to serve as a listening low noise source. The helix needs one half wave of wire on the form using uniform turns between wires with capacity hats at the end. Use a dip meter or aerial analyzer for tuning it up. This short aerial has a pretty narrow frequency response and some way of tuning has to be figured. The use of a capacitor variable can tune to frequency.

Another noise canceling system can be an 80 foot long or more wire and a shorter 40 foot long wire spaced six inches below the 80 foot long wire and a transformer high impedance primary is used. The 80 foot wire attaches to the top and the 40 foot attaches to the bottom lead. The secondary and primary are shielded. The primary has a wire attached to the top of the primary and this wire attaches to one end of a 350 pf variable capacitor, which then attaches to the ground lead from the secondary winding which is in parallel with a second 350 pf capacitor. A single lead from the top of the secondary winding goes to our receiver through the shield. This is said to be most effective against noise.

Barry Boothe, W9UCW, sent me a copy of his loop canceling noise system that he used and wrote about it in his QST article June 1977. He moved to Texas after his divorce. He had tried many loops and found that using aluminum hard line (foam dielectric) $\frac{3}{4}$ inch diameter with a 72 ohm impedance. He made the loop 13 feet in diameter worked very well on receive.

The tuning he said was so sharp that he missed the peak the first few times he tweaked the trimmer. The loop was so effective that on strong signals the preamp would saturate. He found that on strong signals he didn't need the preamp with plentiful signal voltage and he turned it off. He found that his vertical aerial collected noise and was reradiating it to the loop and nearby aeriels. So he moved the loop as far as was possible from the vertical. He spoke to his circle of friends and they were told to detune or ground the vertical when listening with the loop.

The interaction between loop and resonant vertical causes poor receiving characteristics, lopsided transmitting patterns, and messed up polarization. If

you use a 160 dipole and vertical move one for separation of at least one half wave length.

I have purchased a Ramsey Electronics model SM100 signal magnet noise reduction aerial kit configured for 500KHz to 15MHz. Features faraday shield to get rid of static noise by power lines. It has a low noise high gain preamplifier and a one wire connection from tuner to antenna assembly up to 500 feet. You wouldn't think it works best lying on the floor turning it to bring in the weak ones. Yes. Best on the floor. Attic proved more noise pickup. Maybe it was the chimney smoke, don't know. I put the Ramsey magnet into my time wave NC-4 and fried a Ramsey diode and the time wave during transmission RF feedback the time wave also was wounded because I forgot to change one jumper in the time wave for quickest relay change over time.

The EH Aerial

Invented by Ted Hart, W5QJR, 1996
by Deni W9DS

You can find his web site and see for yourself a kind of nvis aerial, but this aerial type is designed to join the E and H waves in phase propagating at the same time. E stands for the electric field and H stands for magnetic field of the aerial a real maverick and bummer to get working because the rulebook has been changed. It creates electromagnetic radiation at the place it stands. The direct wave is line of sight no ground propagation such as normal made aeriels due where a ground wave leaves the earth $\frac{1}{3}$ wavelength away from the dipole which is in or out of phase.

This aerial works with 90 degree phase delayed to the voltage and doubling RF radiation and raises antenna resistance to 120 ohms. Receiving on one is reported suppression of sparking, lightning, and motor noises. The shape of these aeriels is odd and stealthy too. It can be made to look like a back yard decoration. These shapes run like a stovepipe type to bi-cone or dis-cone look. The problem is getting the aerial to get excited at this point of inphasing of these two fields. These aeriels since they have much metal area are small length aeriels with fat fields almost twice the size of a dipole. The author warns that RF burns are possible, and keep it up off the ground.

The metal must be non-ferrous or the magnetic eddy currents will cause loss of radiation and heat. The aerial can be a small loop, and W5QJR holds 3 patents on phasing these aerials. Also, Ted Hart has written and developed the noise bridge, small loop, and other items printed in ham and electronic periodicals.

These aerials are dangerous, doubling EH fields causes much RF power to be released all around the aerial keep your distance running full power. Use low power, 5 watts or so, when testing. These can be as small as 2% of a wavelength rather than 50% of a dipole length. The diameter to length ratio governs the radiation pattern. I will not include any drawings because the web site has all of the information. You can purchase ready units from the companies listed on the web site.

One of the patients and the easiest in phase array network is the star feeding network on the web site. The preferred tuner is a tapped coil for 50 ohms and the low side of the coil is connected to the coax shield. A minus 40 degree current phase shift to the voltage across this tuning coil sets the stage for EH phase propagation. Normally the voltage is near zero on a half dipole center and current is maximum at the same center. The EH setup doesn't look this way at all. The web site may contain other visuals I did not see, and as a matter of fact the tuning process is hard requires the use of equations not found in textbooks.

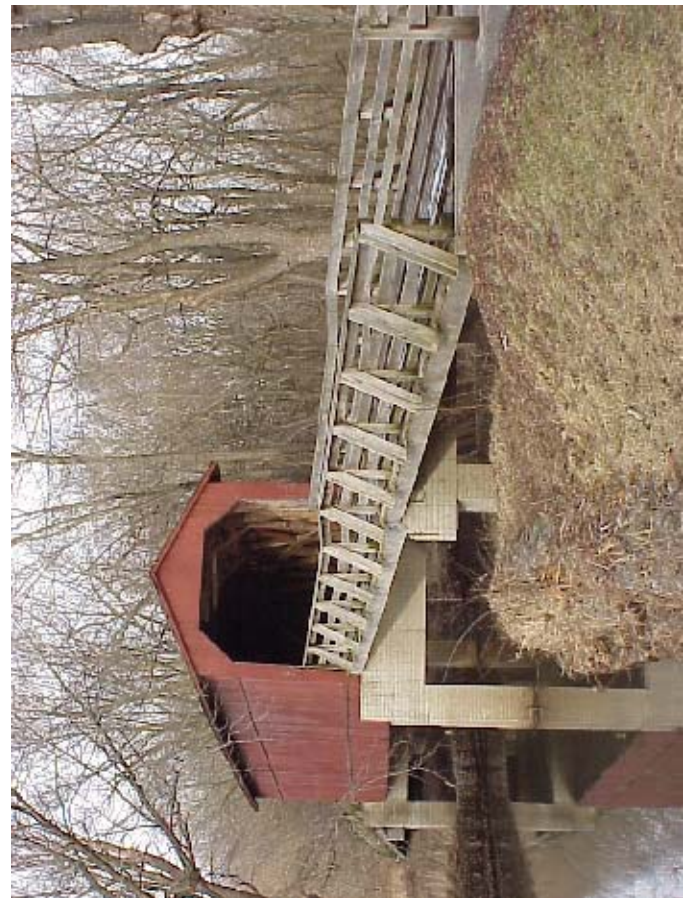
The radiation resistance can't be measured directly and occurs at the point of EH fields being in phase a distance away from the resonant point of the aerial and, therefore mistuning occurs heating begins and radiation is nil. So, a field strength meter is a must. You tune for maximum output and forget about SWR your rig is tuned at this off resonant frequency. This is what you can expect to have to operate. The size of the aerial dictates bandwidth. Heat loss by the current heating the tuning coil relates to efficiency, of course, and the phasing is tunable and bandwidth is 300KHz feeding the aerial with a $\frac{3}{4}$ wave feed line will double the bandwidth. This is not a harmonic aerial.

Gap sells an aerial called the Super C. You can visit the gap web site and download the information.

This may be a type of EH aerial. The aerial was reviewed by Kurt Sterba in World Radio last year. He calculated the information from the web site and the total efficiency was 3%. Check it out.

The W5QJR bi-cone and dis-cone radiation pattern can be adjusted to radiate 360 degrees. There are web sites to visit: www.eh-antenna.com, www.cheuroantenna.com, www.fr-radio.com, and www.qsl.net/km5g (for design program). My advice, if you buy one, follow the instructions explicitly! Use that field strength meter.

KUR waves are his new interest. Strickly magnetic radiation without the electric field. He calls these new aerials new physics, KOR Hz aerials. Claims KOR doubles our frequency spectrum according to Ted Hart.



Glenarm or Hedley or Sugar Creek covered bridge. 58' long, built in 1880. WGN: 13-83-02. Across Sugar Creek NW of Glenarm, Ball Township, Sangamon County, IL. I55 S. from Springfield to exit 83, N. on W. frontage (Frazee – changes to Douglas then to Palm) Rd. 1.8 miles, W. on Covered Bridge Rd. (CR11S) 0.8 miles to the bridge on N. side of the road. (N39 38.436 W89 39.743)

<p>ARGONNE AMATEUR RADIO CLUB P.O. Box 741 Lemont, IL 60439</p> <p>Officers</p> <p>PRESIDENT Bruce Epperson KA9H VICE PRESIDENT SECRETARY Kurt Boerste KB9ZFR TREASURER Charles Doose KB9UMF DIRECTOR Dick Konecny K9IB DIRECTOR Torben Lauritsen KF9MI DIRECTOR Charles Doose KB9UMF DIRECTOR Tim Smith N9UEB DIRECTOR Dale Travis AG9H</p> <p>e-mail: w9anl@bigfoot.com www.bigfoot.com/~w9anl</p>	<p>MEMBERSHIP is open to all who are interested in amateur radio. This club is sponsored by Argonne National Laboratory. Employees of ANL or DOE-Chicago are eligible for full membership. Auxiliary membership is available to non-employees.</p> <p>W9ANL/R is an open repeater, coordinated on 145.19 MHz (-600 input). The AARC repeater has been in operation on this frequency pair continuously since February 5, 1982.</p> <p>CLUB NETS: 2 meter fm 1) Regular, every Monday evening at 9:00 and 2) the Night Patrol every night at 10:30, both on W9ANL/R. The Peanut Whistle Net (PWN) every Sunday at 1:30 p.m., and many evenings at 8:30 p.m. on 1932 kHz (cw/am/ssb), QRP.</p>	<p>RADIOACTIVITIES is published monthly by the Argonne Amateur Radio Club as a nonprofit newsletter intended only for the use of its membership. Material appearing here does not represent the official position of Argonne National Laboratory or the U. S. Department of Energy. Please give credit to the author and to Radioactivities or the Argonne Amateur Radio Club, when using original material published here. Deadline for submissions normally is the 20th of the preceding month.</p> <p>EDITOR Dale Travis AG9H EVENTS SKYWARN ACTIVITIES Deni Lamoreaux W9DS</p> <p>Please send club and editorial correspondence to the club address, or to travisdj@bigfoot.com Please include "AARC" in the subject.</p>
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