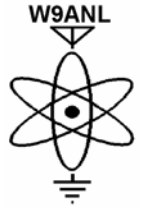


RADIOACTIVITIES

NEWSLETTER OF THE ARGONNE AMATEUR RADIO CLUB



Volume XLVIII, Number 8

August 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 August

09	AG9H	Dale	Decatur, IL
22	K9LJK	Dennis	Palatine, IL
27	K9IB	Dick	Downers Grove, IL
29	WA8LIS	Jan	Homer Glen, IL

"Mini DX-peditioning for Dummies" or how I made 1011 contacts on vacation while preserving my marriage and still seeing some of the local sites.

by Bob McAuley N9QGU

Over the last six years I have made multiple trips to Jamaica, the Bahamas, and St. Martin; and brought some ham equipment along. The following is a summary of lessons that I have learned and insights gained. You may find some of this useful if you plan to take a trip and want to bring your gear along for the ride.

Step One: Getting your paperwork in order or "If You Want to Play Radio, You Got to Have a License".

The European Conference of Postal and Telecommunications Administrations (CEPT) radio-amateur license allows FCC licensees to travel to and operate from many European Countries and their overseas possessions (French Antilles, Netherlands Antilles, French Guiana, French Polynesia ...etc). This is the simplest to use, all that is required is the holder's original FCC license, proof of US Citizenship, and a copy of the FCC's public notice. The FCC notice contains its information in three languages, (English, French and German) and details what US Amateurs need to consider, and what to bring with them, if they want to operate from a CEPT country.

International Amateur Radio Permit --- "For operation in certain countries of the Americas -- allows US amateurs to operate without seeking a special license or permit to enter and operate from that country other than the IARP. For a US citizen to operate an amateur station in a CITEL country, an IARP is necessary. According to the CITEL agreement, the IARP may be issued by a member-society of the International Amateur Radio Union (IARU) -- for the US, the IARU member society is the American Radio Relay League (ARRL). The permit describes its authority in four different languages. The ARRL offers this service to US citizens for their use when they travel to CITEL countries. The ARRL provides this service on a non-discriminatory basis, at no expense to the United States Government" (www.arrl.org/FandES/field/regulations/io/#IARP).

The ARRL maintains a list of countries that have reciprocal licensing agreements with the United States. The requirements vary from country to country. Some countries, such as Jamaica make it very easy to get a license, but very difficult to import equipment. The Bahamas on the other hand makes it easy to get a license and import equipment. However, once you have an active license in the Bahamas. They charge you \$25 per year whether or not you are in the country. So if you got a Bahamas license in 2005 don't return until 2015. You will be charged \$250 for a license when you return in 2015. So if you get a license, make sure you cancel it when you are done.

Step Two: Making It Fit in the Overhead Bin.

If I am going to go to the trouble of getting the appropriate license and bringing equipment to a distant shore, I am not going to rely on the vagaries of QRP propagation. So it's 100 watts or nothing. Transceivers such as the Icom 706 MKIIG may be reasonably light. However, you still need a power supply, tuner, coax, extension cords, and an antenna. The more equipment you bring, the more likely you are to attract the attention of customs agents. But never fear, there are some lightweight non-QRP options.

I use a Gamma Research HPS-1A power supply. HPS-1A is smaller than a Steve King paperback book (Even those from before they started to pay him by the word). It only weighs 1.25 lbs and will fit nicely in the corner of a suitcase or carry on. It will support 100 watts on SSB and 35 watts on FM.

Don't be afraid, there is no magic here. It isn't a "miracle" power supply. It is just an innovative application of well-established technology. For an in depth review of the technology, please see the excellent discussion on AD5X's website (www.ad5x.com).

The LDG Z100 auto-tuner is 14 ounces and will tune 0.1 - 125 watts (50 watts on 6 meters). This tuner is 5.5"d x 5.25"w x 1.5"h and will also fit nicely in the corner of a carry on.

Selecting an appropriate antenna is the most difficult part of the process. Dipoles and long wires are the simplest to carry. However, unless you know the specifics of the area that you are visiting, you cannot be assured that there will be space to hang the wire and something to hang it from. I looked at several commercial antenna options and selected the Force 12 Sigma 5 vertical Dipole. You can find my review of this antenna at www.eham.net/reviews/detail/1691. The Sigma 5 is a five-band 10-20 meter antenna. It works

exceptionally well near salt water and breaks down into 24 inch pieces. So it fits nicely in a duffle bag.

If you are serious about this venture, I also highly recommend that you bring a laptop and logging software. In my most recent adventure, I made 1011 contacts from St. Martin. In the 2 months since I have returned, I have received 196 electronic qsl cards through www.eqsl.cc and 100 paper cards through the mail. It is a whole lot easier to confirm and generate replies if your contacts are available in an electronic format.

Step Three: Have fun.

If you are in a popular DX location, pile-ups happen. Don't let them intimidate you. Just work one station at a time until you get through the pile. Yes, you might encounter bad behavior, when you ask for the "W9 Station" the I5 will keep shouting his call, just ask the I5 to wait, in most instances he will, and then work him when you are ready. It's your pile up; they are all waiting to talk to you. Managing pile-ups is like dealing with children, you have to be consistent. At the end of each QSO, say "QRZ" so that the waiting stations know when to start calling you. If you don't, they will start calling when they think you are done.

In conclusion, DX-peditioning isn't just for the big guns with the deep pockets. It is within reach of the ordinary ham it just requires planning, initiative, and a ticket to a not too far away location.

Helical Wound Mobile Aerial

by Deni W9DS

This dielectric rod must be of constant diameter. Tapered rods will cause a different pattern than wanted, which may affect performance. Rod length represents a $\frac{1}{4}$ wavelength or 90 electrical degrees. Divide rod length into nine sections, each represents 10 electrical degrees. To find the percentage of turns required at each 10-degree segment, use the data in Fig. 1.

The upper $\frac{1}{3}$ of the rod uses 71% of the wire from Fig. 1 (using a constant diameter rod). The winding must occupy that space. From geometry, rod circumference is πd . Dividing 71% of the wire length by the rod circumference will give the approximate number of turns to be close wound. From the wire table in the handbook, find suitable gauge of enameled wire. The wire diameter should not be less than 0.028 inches ARRL shows No.21 B&S gauge at 1500 circular mills per ampere is 0.54 amperes then use a larger diameter rod and recalculate. Using the formula a $\frac{3}{16}$ inch diameter rod, 18 inches long was used to build a ten meter mobile whip.

Mounted on car and tuned 22 watts for one minute of operation, aerial was too hot to touch, therefore wire gauge too small, but it made a finger toaster. Whoopee.

Let's mark off our rod into 9 sections. It will be easy to determine the number of turns in each section as the rod circumference is known and the total length of wire. Divide circumference into the length to determine the total number of turns. Now divide each section into inches. Note that a change of turns per inch exists, section-to-section. Mark each number of turns in each progressive inch to allow the change of turns per inch. Winding then will have constant change in pitch, and no sudden change of pitch will be seen. Mark the position of each turn. Anchor one end of wire and secure the other end to the "lose wound" end of the fiberglass rod and wind on. After completing the winding lock the top end with tape, then adjust the turns to smooth out any unevenness in the winding. Secure the whole winding with epoxy.

Mount the aerial in its operating position. Make sure the car or truck has an open space of at least 20 feet around it. Use a 2 turn loop to ground the bottom end of the aerial. Couple a grid dip oscillator frequency with accurately calibrated receiver. Frequency should be lower than required. Remove turns from the close-wound (top) end, turn by turn, until gdo dips at the low end of the band. The aerial will load over the band by adjusting the transmitter tank circuit.

The multiband 40-10 meter version acts like an HF choke. As frequency is increased, resonances occur at different frequencies. These resonances are governed by aerial shape, wire inductance, and distributed capacity. Low impedance feed conditions at resonance aren't usually harmonically related. This aerial does have this ability. Resonances occur in the ham bands and feed through impedance allows our aerial to be loaded by the conventional mobile pi-section tank circuit. By adding about 60uH in series with aerial base most of the 80-meter may be covered. The aerial will tune 160 meters with enough inductance added at the base.

From band to band, feed point impedance at resonance varies usually 15 to 50 ohms. No problems using RG8U feed line about 15 feet long. Forget SWR! As long as the aerial can be loaded improving SWR adds very little to the radiation. The usual pi-section is enough unless, in certain manufactured transceivers, the 50-ohm termination is restricted then tuner is called for.

The aerial rod is fiberglass with a diameter of 3/4 of an inch from 8' to 8' 3" long. Lay rod on a bench or table. Mark off the turn positions along the rod (Fig. 2). Scratch the marks so they won't rub off when winding.

Mark off from the top end as in Fig. 2. Wind as told before and end in the same way. Use only 0.40 inch enameled (18AWG) a suggested aerial mounting is given in Fig. 3.

Tune the aerial by removing turns from the top of the aerial until it resonates in the low end of 40 meters. Check resonances on the other bands with gdo. An increase or decrease in rod diameter will change the resonant frequency. After each adjustment of the aerial check over the band, on each band should be made. Compromise may be necessary in some cases, but the author didn't have this experience. When testing, aerial must be resting on its normal operating position on the car. Going from car to car may require some adjustments. Removing turns from the top has a profound effect on 40 meters and a lesser effect on 15, still lesser on 20 and 10.

For 80 and 160 meters a suitable coil may be used. The aerial should be resonated, as before, at the lowest frequency of the band you intend to use. Again, check the loading across the entire band. The aerial should take power if your xmitter output circuit is not too restricted use a tuner. The author says ZS6U has designed a 40, 20, and 15 meter single section, which screws into a hustler in place of the loading coil. Changes of wire gauge are used for this aerial, but details aren't available. Performance is at least equal to the single band arrangements.

Here are additional resonances, but no attempt to operate on these frequencies typically mentioned 3.62, 7.05, 14.2, 21.1, 28.28, 31.8, 37.42, 44.5, 56, 67, etc.

Polarization is vertical. There is less response signal strength when aerial is moved from vertical than that measured from a base loaded vertical aerial under the same conditions. It's easy changing bands simply by reloading or by switching a relay to remove the short across the 80/160 coil.

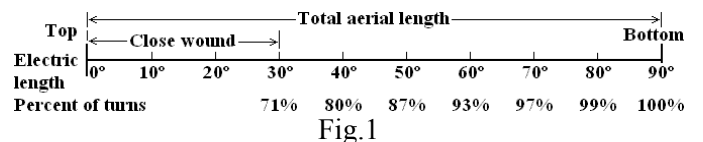


Fig.1

Diagram showing % of wire turns as a function of aerial length in electrical degrees. About 70% of total number of turns must be close-wound over top 1/3 of aerial.

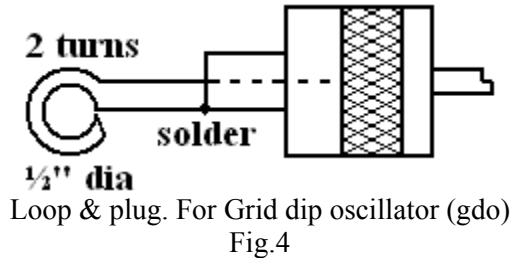
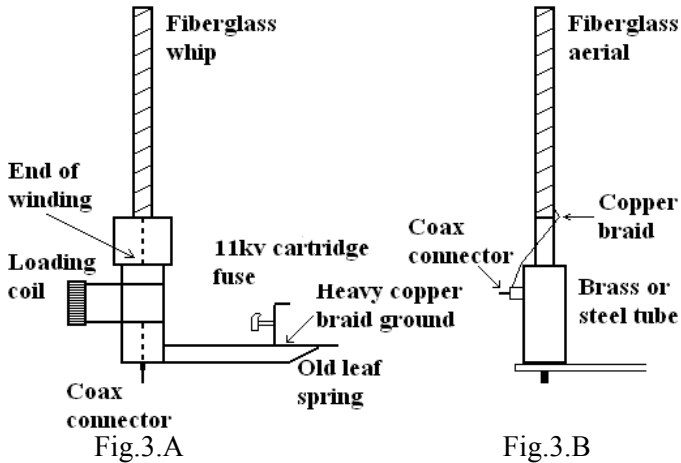
Sections	1	2	3	4	5	6	7	8
Inches	15 3/4	12	12	12	12	12	12	8 3/4
Turns	360	99 1/2	69	52 1/2	37	21 1/2	7 3/4	1/4

Fig.2

Winding details for a 4-band aerial. No. 18AWG enameled wire is recommended.

Section winding data:

- | | |
|---|--------------|
| 1. 360 turns close wound | turns inches |
| 2. $19\frac{1}{2}/9/9/9/8\frac{1}{2}/8\frac{1}{2}/8\frac{1}{2}/8/7\frac{1}{2}/7\frac{1}{2}/7\frac{1}{2}/7/$ | turns inches |
| 3. $17/6\frac{1}{2}/6/6/6/5\frac{1}{2}/5\frac{1}{2}/5\frac{1}{2}/5/5/5/$ | turns inches |
| 4. $15/5/5/4\frac{1}{2}/4\frac{1}{2}/4\frac{1}{2}/4\frac{1}{2}/4/4/4/4/3\frac{1}{2}/$ | turns inches |
| 5. $17/7/6\frac{1}{2}/6/5\frac{1}{2}/5/$ | turns inches |
| 6. $14\frac{1}{2}/4\frac{1}{2}/4/3\frac{1}{2}/3/2/$ | turns inches |
| 7. $12/2/1\frac{1}{2}/1\frac{3}{4}/1\frac{1}{2}/$ | turns inches |
| 8. $\frac{1}{4}$ turn over the last $8\frac{1}{4}$ inches | |



How to get the Best From Mobile Whips

by Deni W9DS

Having been HF mobile myself for several years I know it takes a resonant frequency finder to get you on the right track and then finding ways to get the best signal out of the whip. Matching the feed line with the impedance or the radiation will stay inside the car. When tuning stay away from buildings, people, car doors, and trunk must be closed. Loosely coupled by grid dip meter with a link so you can be sure of the resonant frequency. The grid dipper meter will show a big dip at resonance and that is what you need to know.

I don't have anything short enough for 1/2 of a page.

Deni: The 2 articles that I have left will fit next month, with room to spare, plus I have your last one that I haven't done the figures for. Then I'm out of material.



The Jackson covered bridge. 200' long x 14' wide. Built in 2000, WGN: 13-18-B

Across the Embarrass River SW of Greenup, Cumberland County, IL. IL121 SW 0.8 miles from jct with IL130 in Greenup, continue SW on Cumberland Rd. 1.1 miles to the bridge. It is the longest single-span covered bridge not posted with restrictions & will support fully loaded semis placed nose to tail. This is a replica of the original Jackson covered bridge built on this site in 1832. (N39 14.33 W88 11.23)

<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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