

# MOUNTAIN SPARK GAPS



NPARC - The Radio Club for the Watchung Mountain Area

VOLUME 40

April 2005

NO. 4

**N2XJ**  
**Club Callsign**

## **Auction - Auction - Auction** **Friday April 8th, at the Salt Brook School** **No Regular Meeting Scheduled for April 11th** **Project Meeting on April 25 at Salt Brook School**

### **From: The Prez**

Three Years Old?

It's too bad we can't count our age in "Sunspot Cycle Years". If I started counting when I got licensed in 1969, I would be three, based on Cycle 20 being my birthday. Well, I guess I will have to face the fact I will be 51 this month and live with it!

Anyway, we are in a solar minimum and in surfing the web, it is interesting that some people correlate weather patterns, economic trends and worldwide tension and crises with the sunspot cycle, particularly at the peak of the cycles. (All those "negative ions"!)

Actually, what got me thinking about my "Novice" days, licensed as WN2JVO, was a photo I found of my Novice rig. My dad (W2IOC SK) and I built it on a "breadboard". As I recall, it was crystal controlled and ran the "legal limit" 75 watts. I wish I could find the circuit for it. Maybe someone with an ARRL Handbook from that era would find it. (No, the rig will not be auctioned at the NPARC Auction! It was dismantled for parts years ago, unfortunately.)



In other matters, remember that the Club Auction is on April 8<sup>th</sup>. It is shaping up as a good one with lots of real Ham gear up for bid. And if you are thinking of going to Dayton, you had better start planning soon. I already have my ticket and a room reserved. I am sure you could still find rooms if you act soon enough. And remember that Field Day planning begins on the second meetings in April and May. I can't wait!

73 es 88 Al K2JV

### **Field Day Planning**

Our Project Meeting scheduled for April 25th at the Salt Brook School will be devoted to Field Day Planning. Field Day is one of the most important Ham Radio events of the year and the Club has historically been very active in it.

For the last few years we've been using a location at Governor Livingston High School in Berkeley Heights. Most recently the location has been close to the school building, with plenty of parking, and easily visible to the neighbors and the public. This is all to the good for our Public Image, as serious and capable radio communicators.

The meeting scheduled in April will be critical in deciding the form of this years Field Day. Will it be QRP stations and how many of them, or will it be KW amplifiers? What kind and how many antennas will be used? How will power be supplied? Who will supply food and drink, and what kind?

Most Club Members take some part in Field Day. Many are serious operators and willing to work CW late into the night. Many are more interested in VHF and UHF DXing from this very good location at the top of the Watchung Ridge. Many others revel in the setup and take down of the antennas and all the equipment.

Whatever your interest may be you can find some place to help out on Field Day. So be sure to come to the Field Day Planning meeting on Monday April 25th!



NPARC  
THE WATCHUNG HILLS  
AREA RADIO CLUB  
P.O.Box 813  
New Providence, NJ 07974  
ARRL Affiliated Club 0213

## Meeting Schedule

**Regular Meeting:** 7:30 - 10:00 PM  
**2nd Monday of each month** at the  
Salt Brook School Cafeteria  
Springfield Ave. and Maple St.  
New Providence.

**4th Monday each month:** 7:30 - 9:00  
Informal Project Meeting, at the  
Salt Brook School Cafeteria  
Springfield Ave. and Maple St.  
New Providence.

### Everyone is Welcome

If a normal meeting night is a holiday  
we usually meet the following night.  
Call the contacts below.

## Club Officers for 2005

President: K2AL Al Hanzl  
908-464-1323  
Vice Pres: N2VI Eric Grosse  
908-322-9653  
Secretary: KC2RLM Ralph Milnes  
973-377-7061  
Activities: K2EZR Frank McAneny  
908-464-5285  
Past President: AB2CM Harry Schwill  
908-322-8867  
Treasurer: K2JV Barry Cohen  
908-464-1730

## On the Air Activities

### Club Operating Frequency

145.750 MHz FM Simplex

### Sunday Night Phone Net

Whippany Repeater at 9:00 PM  
Transmit on 147.63 MHz  
Receive on 147.03 MHz  
Net Control: KB2IKC

### K2AGI Memorial Digital Net

Sunday evenings 8:00 to 9:00 PM  
Various Modes 145.75 MHz  
Net Control: K2GLS

## Club Internet Addresses

Website: <http://www.qsl.net/nparc>  
Reflector: [nparc@mailman.qth.net](mailto:nparc@mailman.qth.net)  
Webmaster: KC2RLM, Ralph

## MOUNTAIN SPARK GAPS

Published Monthly by NPARC, Inc.  
The Watchung Mountain Area Radio Club  
P.O. Box 813  
New Providence, NJ 07974  
©NPARC 2005 All Rights Reserved

Editor: K2JV Barry Cohen  
Editor Emeritus: K2AGI John Sheetz  
Contributing Editors:  
KC2RLM Ralph Milnes  
WB2QOQ Rick Anderson

## Climatological Data for the Watchung Mountain Area Provided by WB2QOQ, Month of March



	2005	2004
Maximum Temp.. °F:	61	71
Minimum Temp. °F:	12	18
Average Temp. °F:	36.1	42.2
Total Precip Rain/Snow (in.):	1.19/6.3	1.94/7

The above information was provided by WB2QOQ, who has been recording daily weather events at his station for the past 23 years.

## Calendar of Coming Events

April 8th **FRIDAY: NPARC ANNUAL AUCTION** at the Salt Brook School. Bethere before 7PM!

April 11th: **NO REGULAR MEETING**

April 18th: **TCRA MEETING** on Fox Hunting Antennas. 8 PM at the Union Elks Club, see Page 3 for details.

April 22nd: **FRIDAY, HOBBY DAY** at Mountain Park School in Berkeley Heights. HF Station set up and operating.

April 25th: **PROJECT MEETING** devoted to Field Day Planning

May 9th: **REGULAR MEETING** Jerry Sevick will present a talk on cores and materials for RF Transformers. This will also be delivered at the Dayton Hamvention

May 20 - 22: **DAYTON HAMVENTION**. It's not too soon to think about attending this year! Rooms are still available.

***MORE EVENTS???** Send info to [k2jv@arrl.net](mailto:k2jv@arrl.net)!!*

## March 28th Meeting was a "Buzzing Success."

Those of you who don't come to our Project Meetings are really missing out on a great deal of interesting subject matter. During the last Monday meeting of March some of our most imaginative and technically competent members presented projects which they are working on.



As if being our regular NCS on Sunday nights, our resident Astronaut for the Salt Brook Statics, and our guru on battery systems, metallurgy and chemistry, is not enough, Bob KB2IKC has taken up Helicopter Piloting! He gave us an entrancing demonstration by flying his machine all over the conference room.

After the Helo operations, Eric N2VI, Bob K2GLS and James KB2FCV set up operating digital mode stations and demonstrated all the things which could go wrong, and will go wrong, for a novice in operating on these modes. Since they will continue the Sunday night K2AGI Memorial digital net, we can all stand to learn from these guys.

**LESSON:** These are great informal meetings and learning opportunities.

## Fox Hunting Antennas

at TCRA Meeting on April 18th

Reprinted by permission: *TCRA NEWS* April '05

Several antennas were discussed at the March 7th meeting. Please visit the web addresses listed below and order the kits or purchase the needed parts for the antenna(s) you would like to assemble at the April 18th meeting. We will then test them in the spring during a Fox Hunt.

The first antenna discussed was the Handy Finder. The Handy Finder is a phase detector. It consists of two antennas and a small switching circuit. The two antennas are alternately switched on and off at a rate of 1 KHz. When the observed signal is received on one antenna before the other, the two antennas are out of phase with the source signal. The result is the appearance of a 1 KHz tone on the incoming audio. When the incoming signal is received by both antennas at the same time, the tone disappears, which indicates that each antenna is an equal distance from the source. Therefore, you are pointing right at the signal source! The unit theoretically works on any frequency, but it's most effective frequency range is from 50 MHz to 500 MHz. Kit comes with; board, components, antennas, coax and BNC connector. Cost \$21.00 To purchase the Kit click on the following URL:  
<http://www.towerofwine.com/steven/handy.htm>

The next antenna discussed was a three element portable hand held Yagi for 2 Meters by Arrow Antenna. Cost \$49.00 plus shipping. To purchase click on the following URL:  
<http://www.arrowantennas.com/146-3ii.html>

The last two are from a web site by Joe Leggio, WB2HOL. A 2 element and a 3 element Yagi built using 1 inch wide tape measure blade. His site gives detailed instructions, but you need to purchase the needed parts. I purchased the tape measure blade at Sears, the PVC pipe and fittings at Home Depot and the RG-58 coax cable with BNC connector from Radio Shack. I estimate the cost for the 2 element Yagi to be less than \$13.00 and the 3 element Yagi to be less than \$17.00 To get the article with instructions for the 2 element Yagi click on the following URL:  
[http://home.att.net/~jleggio/projects/rdf/snif\\_bm.htm](http://home.att.net/~jleggio/projects/rdf/snif_bm.htm)  
To get the article with instructions for the 3 element Yagi click on the following URL:  
[http://home.att.net/~jleggio/projects/rdf/tape\\_bm.htm](http://home.att.net/~jleggio/projects/rdf/tape_bm.htm)

NPARC members wishing to attend the TCRA meeting on April 18th please contact Bob at [KB2BBD@arrl.net](mailto:KB2BBD@arrl.net) so they will be able to welcome you and give directions if needed.

## ERT Members

### Active in TOPOFF-3

NPARC and all its members can be justifiably proud of those members who are also part of the Emergency Response Team. During the week of April 4th, a major International emergency exercise will be held under the auspices of the Department of Homeland Security. One focus of the exercise will be right here in Union County NJ. Others will be in Middlesex County,



Three ERT members setting up our crossband repeater antenna at a location high on the first Watchung ridge. They are (L-R) Barry K2JV, Harry AB2CM, and Eric N2VI

in New London Connecticut, and in Canada and in the United Kingdom.

NPARC's part of this comes from the many public service agencies which we serve with emergency communications. These

include the Red Cross, the New Providence Office of Emergency Management, and various hospitals in our area which are associated with the NJ Hospital Association. Red Cross is the only non-governmental agency officially engaged in the TOPOFF-3 exercise, and they have officially asked us to supply communications during the exercise.

The members of the ERT are really living up to the Fundamental Purpose of having a Ham License: "...particularly with respect to supplying emergency communications." If and/or when an emergency occurs, is no time to start to "charge your batteries and get ready" to communicate.

---

## Salt Brook Statics Report

Unfortunately, there isn't much activity on the Salt Brook Statics Project. Due to School Holidays and days off we haven't met with the kids since the middle of March. The next scheduled meetings will be April 11th and April 25th, so we'll get things started up again.

There is still no news or projected date for our QSO with the Astronauts, but that's a good thing since our Yagi array is still not completed. I look forward to having both antennas ready within about two weeks.

As soon as the WX is reliable, we'll have an antenna party at the school, and install the HF tri-band vertical with it's ground plane. Watch for further notice.

James Clerk Maxwell  
**Discoverer of Electromagnetic Waves**

submitted by O. Paul Schreiber W2UH

Hams owe much to James Clerk Maxwell (1831-1879), who in 1873, developed his famous equations that are the basis of all subsequent electromagnetic theory, particularly how electromagnetic waves radiate from our antennas and propagate through space.

From the early 1700's on, all experiments, by Ben Franklin and many others, were with static electricity and permanent magnets. The common theory for the attraction of like charges and repulsion of unlike charges, and like and unlike magnetic poles, was force at a distance, analogous to gravity. Static electricity, stored in Leyden jars and similar devices, was the only source of electric current, inhibiting experiments requiring strong, steady currents.

All that changed with Alessandro Volta's invention of the electrochemical battery, called a pile. Hans Oersted in 1820 showed that a steady current in a wire caused a compass needle to deflect, the first proof of interaction between electricity and magnetism.

There followed a very synergistic relationship between Michael Faraday (1791-1867) and James Maxwell. Faraday was a thorough experimenter, carefully designing and recording each experiment into the relation between electric and magnetic phenomena. Maxwell was the great physicist and genius mathematician who would explain this relationship.

Faraday's important contribution was the discovery of magnetic and electric fields. He postulated that these fields had lines of magnetic and electric force. In one important test he passed a magnetic bar in and out of a wire coil, inducing a current. The magnitude and direction of the current depended on the speed and direction of the magnet's movement. Faraday also built the first transformer and basic generator.

Intrigued by Faraday's discoveries, and encouraged by William Thomson, Lord Kelvin, to further explore Faraday's concept of lines of force, Maxwell started a careful, step-by-step process seeking a mathematical explanation for electromagnetic fields. In this endeavor he used his previous work on heat transfer and liquid flow in tubes, known physical laws, and above all, his mathematical insights. Maxwell's treatise of 1873 on electromagnetic fields included his famous equations. Four simply stated, but difficult to understand, differential equations correctly predicted, and continue to predict, all electromagnetic phenomena. Based on these equations, Maxwell accurately computed the velocity of electromagnetic waves and postulated correctly that light was also electromagnetic radiation.

But this was still unproved theory. Maxwell never experimentally proved the existence of electromagnetic waves, but Hertz did 15 years later. Heinrich Hertz, a German physicist, was a professor of physics at Karlsruhe Polytechnic when he began experiments to prove Maxwell's electromagnetic waves were real. Success came in 1888 when he discharged stored static electricity into an induction coil with a gap between two brass knobs. The induced high voltage oscillation caused a spark at the gap. A loop with similar knobs several yards away sparked in response. Interestingly, the resonant frequency was above 300 MHz. Hertz also experimentally confirmed Maxwell's prediction of the velocity of electromagnetic waves.

Guglielmo Marconi as a boy took a keen interest in the work of Maxwell and Hertz. At age 21 in 1895 he started wireless experiments in Italy, reaching a distance of one and a half miles. The next year he moved to England and obtained the first patent for wireless telegraphy. Marconi's famous transatlantic transmission occurred in December 1901. An assistant sent a series of S's from England to Marconi in Newfoundland on 820 kHz, in the middle of the present AM broadcast band, and far below the 300 MHz used by Hertz.

Lee De Forest's invention of the vacuum tube triode in 1907 was the next major step in long-range radio communications. Soon hams were talking to the world, often with nothing more than sensitive one-tube receivers and one-tube transmitters on a wide range of discrete frequencies, CW in ham jargon.

It was Maxwell's equations that allowed Dr. Hidetsugu Yagi to develop his famous beam antennas. Nowadays, hams use readily available software to design experimental antennas, unaware that Maxwell's equations still predict all electromagnetic phenomena.