

# **MOUNTAIN SPARK GAPS**

**NPARC—The Radio Club for the  
Watchung Mountain Area**



**Website: <http://www.nparc.org>  
Club Calls: N2XJ, W2FMI  
Facebook: New Providence Amateur Radio Club  
(NPARC)**

**VOLUME 53 NO. 3 March 2018**

## **UPCOMING EVENTS**

**Tri County RC  
Fox Hunt  
Sunday June 3**

**New Providence Memorial Day Parade  
Monday May 28  
See Inside**

### **Regular Meetings**

**4/9 & 4/23  
Monday 7:30  
DeCorso Community Center**

## Meeting Schedule

**Regular Meeting:** 7:30—9:00 PM  
**2nd Monday of each month** at the  
NP Senior & Adult Center  
15 East Forth Street  
New Providence

**Informal Meeting:** 7:30—9:00 PM  
**4th Monday of each month**  
**Same location**

**Everyone is Welcome**

If a normal meeting night is a holiday,  
we usually meet the following night.  
Call one of the contacts below  
or check the web site

## Club Officers for 2018

President: W2PTP Paul Wolfmeyer  
201-406-6914  
Vice President: K2GLS Bob Willis  
973-543-2454  
Secretary: K2AL: Al Hanzl  
908-872-5021  
Treasurer: K2YG Dave Barr  
908-277-4283  
Activities: KA2MPG Brian Lynch  
973-738-7322

## —On the Air Activities

Club Operating Frequency  
145.750 MHz FM Simplex

Sunday Night Phone Net  
Murray Hill Repeater (W2LI) at 9:00 PM  
Transmit on 147.855 MHz  
With PL tone of 141.3 Hz  
Receive on 147.255 MHz  
Net Control K2AL

Digital Net  
First & Third Mondays 9 PM  
28,084 — 28,086  
Will be using PSK and RTTY  
Net control K2YG

## Club Internet Address

Website: <http://www.nparc.org>  
Webmaster KC2WUF David Bean  
Reflector: [nparc@mailman.qth.net](mailto:nparc@mailman.qth.net)  
Contact K2UI, Jim

## MOUNTAIN SPARK GAPS

Published Monthly by NPARC, Inc.  
The Watchung Mountain Area Radio Club  
P.O. Box 813

New Providence, NJ 07974  
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WB2QQQ Rick Anderson  
W2PTP Paul Wolfmeyer  
K2UI Jim Stekas

## Climatological Data for New Providence for February 2018

The following information is provided by  
Rick, WB2QQQ, who has been recording  
daily weather events at his station for the  
past 36 years.

### TEMPERATURE -

Maximum temperature this February, 74 deg. F  
(February 21)

Last February (2017) maximum was 74 deg.  
F.

Average Maximum temperature this February,  
46.8 deg. F

Minimum temperature this February, 12 deg. F  
(February 3)

Last February (2017) minimum was 13 deg. F.  
Average Minimum temperature this February,  
30.5 deg. F

Minimum diurnal temperature range, 2 deg.  
(39-37 deg.) 2/23

Maximum diurnal temperature range, 31 deg.  
(59-28 deg.) 2/12

Average temperature this February, 38.7 deg.  
F

Average temperature last February, 38.9 deg.  
F

### PRECIPITATION -

Total precipitation this February - 6.6"  
snow; 5.45" rain/melted snow

Total precipitation last February - 6.25"  
snow; 2.15" rain/melted snow

Maximum one day precip. event this February  
-

February 17, 6.0" snow; February 11, 1.03"  
rain

Measurable rain fell on 17 days this Febru-  
ary, 7 days last February.

Measurable snow fell on 2 days this Febru-  
ary, 1 day last February.

YTD Precipitation - 8.49" (includes rain +  
melted snow, as of 2/28/18)

=====  
Rick Anderson  
3/2/18

243 Mountain Ave.  
New Providence, NJ  
(908) 464-8912

[rick243@comcast.net](mailto:rick243@comcast.net)

**Lat = 40 degrees, 41.7 minutes North**

## President's Column March 2018

If you missed Monday's program on tower climbing, take a look at the links Brian sent out on the reflector. It's awe-striking to those of us who avoid risk!

**It's time to get plans and equipment together for the Fox Hunt on Sunday PM, June 3<sup>rd</sup>.**

Bob Willis K2GLS has pulled together some info you should check out; he also brought a direction-finder to the club meeting and demonstrated it. Thanks Bob! For your convenience, I'm including Bob's info, posted on a recent reflector message, for you:

Notes on Fox Hunting Direction Finders

My (B0b's) antenna - HANDI-Finder

QST May 1993 description and construction, Bob Leskoves, K8DTS

Web site: [www.handi-finder.com](http://www.handi-finder.com)

Order site: <http://www.noard.com/noardhdf.htm>

Sense the Right Way to Go with HANDI-Finder, Joe Moell K0OV.

Web site: <http://www.homingin.com/hfinderfix.html>

Tape Measure Beam Optimized for Radio Direction Finding, Joe WB2HOL.

Web site: [http://www.theleggios.net/wb2hol/projects/rdf/tape\\_bm.htm](http://www.theleggios.net/wb2hol/projects/rdf/tape_bm.htm)

Homing In - A good website on all aspects of RDF.

The Art and Science of Radio Direction Finding (RDF)

Web site: <http://www.homingin.com/>

A lot more good information on HANDI-Finder and other techniques.

Radio Direction Finder RDF Projects Joe WB2HOL

web site: <http://www.dhawke.com/kq1lweb/documents/rdf.pdf>

It turns out the HANDI-Finder from MAY 1993 QST was packaged as a kit and THEY ARE STILL AVAILABLE!! The cost for each is about \$30. Think about whether you'd like to order one which we'll put together as a club project. Please be prepared to commit at the April 9 meeting (or let me or Bob know before the meeting, if you can't attend).

And we have the Memorial Day parade coming in May. Let Rick WB2QOQ know if you can participate with us.

73 for now

Wolf

W2PTP

201-404-6914 or [W2PTP@arrl.net](mailto:W2PTP@arrl.net)

## New Providence Memorial Day Parade

NPARC members are invited to participate in this years Memorial Day Parade, taking place on Monday, May 28. Our club has annually participated in this town event, for as long as I can recall; and a decent attendance in this club activity is requested. This is the one public event where hundreds of town's people get to see the club members, and a good attendance is most welcomed. Last year there was a small participation in our parade unit. As in past years, we request members to initially meet in the New Providence Memorial Library parking lot at 9:25 a.m., and we will truck pool over to our starting position on Central Avenue. Suggested dress code is club shirt, blue slacks, NPARC yellow cap, and of course your 2 meter HT, tuned to club frequency.

Our unit will walk the parade route, down Springfield Ave., between Central Ave. and Academy St. Please consider taking part in this community event.

Please contact Rick, WB2QQQ, if you will be participating in the parade or have questions. rick243@comcast.net; (908) 464-8911. Thanks Much !

## **Fox Hunting Tips**

### **Jim Stekas - K2UI**

The idea of a Fox Hunt (FH) is to locate a hidden transmitter through radio direction finding (DF). There is tons of information on FH on the web, so you can dive in as deep as you want. Popular bands for Fox Hunting are 80m and 2m. Since the June 3 W2LI hunt will be on 2m I will focus on that band.

#### **Map and Compass**

Good paper maps, a pencil and a compass are essential tools for a FH. The general approach to DFing the fox is to triangulate its position by using a directional antenna and determine the fox's bearing from different locations. The compass should help you determine the true bearing your antenna is pointed toward so you can transfer bearing measurements onto the map. These lines should all pass through the fox's position. Since our measurements won't be perfect, the lines will not cross perfectly at a single point so the fox's position is somewhere within an area of uncertainty (AOU).

To minimize the AOU it is important to have bearing measurements that cross at right angles (cross-fixes). If your driving North and bearing lines are crossing to the West (left), it would be wise to turn left and get add some cross-fix measurements, as well as move toward the fox.

#### **Directional Antenna**

The ideal DF antenna should have good directivity and be very portable, two contradictory requirements. A very popular DF antenna these days is a 3-element Yagi made from a metal tape measure and some PVC. It has a good front-to-back ratio gives and will generally give a peak signal in a unique direction. The down side of the Yagi is that you'll need to stop the car and get out to get take bearing reading, which isn't possible on highways.

An Adcock (two out-of-phase dipoles) or small loop antenna can give sharp peaks and nulls and are small enough to be mounted to a luggage rack and rotated while driving. The down side to these antennas is that they have a 180 degree ambiguity, so a strong peak could mean either North or South. To resolve the ambiguity you'll need to keep driving until you get some crossing lines of bearing.

If we start the hunt in the Bell Labs parking lot and our loop antenna points North/South what should we do? We would have to drive East (or West) on Mountain Ave until we resolved the N/S ambiguity. If had a tape measure Yagi there would be no ambiguity, we would go to South St. and head North. Ideally we would bring both a Yagi and a loop and have the best of both worlds.

#### **Receiver**

Your receiver should be convenient to operate from a car, and have enough battery power to last at least 2hrs. A handy-talky is fine, but be sure it has a good signal strength indicator since you will be using that to find signal peaks and nulls with your directional antenna.

Once you get close to the fox, you will need to attenuate the signal from the antenna to prevent overloading your RX so you can get good measurements. The signal level of the fox will increase about 100dB from start to finish but if you try to add 100dB of attenuation between the antenna and

RX, the signal from the fox will bypass the antenna and attenuator and leak through the case! A loose or broken coax connector tends to cause signal drops of 40dB or so. To get a drop of 100dB your RX needs to be in an sealed metal enclosure.

For closing the final few hundred yards I have found it useful to swap out the receiver for a field strength meter. These are easy to build, and if you have one of those cheap SWR bridges from the CB era, it probably has a field strength mode. Just connect the field strength antenna input to the SO-239 antenna connector and you're ready to go.

### **Reflections on Mother Nature**

In the Fox Hunting 101 textbook the earth is perfectly flat, the ground is non-conducting, all waves are plane, and there is always a direct path between you and the fox. In the real world things are very different. Much of the time signals will arrive through reflected paths off of hills, buildings, power lines, etc. Be aware of the environment around you and try to use it to interpret inconsistent bearing measurements. If the signal drops out, look around and see what feature of the terrain might be responsible for blocking the signal. You may be able to infer a line of bearing that grazes the side of the hill responsible for the dropout.

Be sure to use the environment to you advantage when you can. A road on the top of a hill with a broad scenic view is going to provide a great view for your DF antenna as well. Similarly, if you can't see much, neither can your antenna.

### **Hunting a Sly Fox**

Expect the fox to put some effort into finding a hiding place that will make life hard for the hunters. In reality, there are no easy hiding places to find, so the fox doesn't need to try too hard to make our job difficult.

One sly trick is to hide on a new road that isn't even on the map yet. A smart phone with Google Maps would help in this case. Another trick is to pick a place where roads are under construction and navigation is difficult, e.g. the Morris Ave. bridge in Summit.

Locations just off a major highway, midway between two exits will also pose a problem. If the fox is close to the road you may drive right by without getting any indication on whether he's on the left or right side of the road. So you'll need to flip a coin at the next exit and decide which side of the highway you will search. Where the exist, back roads might be a better choice than the highway.

### **Final Thoughts**

The ARRL Handbook and Antenna Book have pretty good coverage of DF techniques and antennas. A few Google searches will uncover tons of additional information and fancy DF techniques (e.g. pseudo-doppler systems.)

If you are new to fox hunting my suggestion is to keep it simple. Build a simple Adcock or tape measure Yagi, grab a decent set of maps, and work the problem. Follow what your measurements tell you and apply some common sense. You will have fun and learn a lot in the process.