

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. 5 May 2018

UPCOMING EVENTS

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

**FIELD DAY
June 26,27
Governor Livingston HS
Berkeley Heights**

**Regular Meetings
6/11 & 6/25
Monday 7:30**

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
Contact K2UI, Jim

MOUNTAIN SPARK GAPS

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Editor: K2EZR Frank McAneny
Contributing Editors:
WB2OOQ Rick Anderson
W2PTP Paul Wolfmeyer
K2UI Jim Stekas

Climatological Data for New Providence for April 2018

The following information is provided by Rick, WB2OOQ, who has been recording daily weather events at his station for the past 36 years.

TEMPERATURE -

Maximum temperature this April, 85 deg. F
(April 14)
Last April (2017) maximum was 86 deg. F.
Average Maximum temperature this April, 58.7 deg. F
Minimum temperature this April, 27 deg. F
(April 9)
Last April (2017) minimum was 33 deg. F.
Average Minimum temperature this April, 37.6 deg. F
Minimum diurnal temperature range, 8 deg.
(60-52 deg.) 4/25
Maximum diurnal temperature range, 39 deg.
(85-46 deg.) 4/14

Average temperature this April, 48.2 deg. F
Average temperature last April, 56.2 deg. F

PRECIPITATION -

Total precipitation this April - 6.0" snow;
5.49" rain/melted snow
Total precipitation last April - 3.52" rain
Maximum one day precip. event this April -
April 2, 6.0" snow; April 16, 2.68" rain
Measurable rain fell on 11 days this April,
13 days last April.
Measurable snow fell on 1 day this April, 0
days last April.

YTD Precipitation - 18.39" (includes rain +
melted snow, as of 4/30/18)

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Rick Anderson

5/19/18

243 Mountain Ave.
New Providence, NJ
(908) 464-8912
rick243@comcast.net

Lat = 40 degrees, 41.7 minutes North

Long = 74 degrees, 23.4 minutes West

Elevation: 380 ft.

CoCoRaHS Network Station #NJ-UN-10

President's Column May 2018

First, thanks to Rick, WB2QOQ, for coordinating the NPARC participation in the New Providence Memorial Day Parade—it went smoothly with ten marchers and 3 “cheerers” (K3EFB, K2JV, and K2EZR).

It's time to get food and equipment together for the Fox Hunt on Sunday PM, June 3rd. The Fox Hunt will start with the picnic at noon. NPARC participants need to provide side dishes such as salads, coleslaw, chips, etc. and dessert. TCRA will provide soda, hot dogs, hamburgers, rolls and condiments. The Fox Hunt on foot will start around 2PM. When complete the Road Fox Hunt will start (around 3PM). Our expected participants are at this point: N2SLS, KC2WUF, KC2ONL plus one, K2UI, K2AL, K2YG, KD2JRI, W2PTP, KC2HLA and Eric, and K2HEN. Thanks to Bob Willis, K2GLS, for all his work researching and sourcing the handi-finder; unfortunately, he has a conflict the day of the event.

Field Day will soon be upon us—June 23 and 24. Our location is expected to be Governor Livingston High School in Berkeley Heights. Our meeting, June 11 will be a critical one for final planning and task signup.

73 for now
Wolf
W2PTP
201-404-6914 or W2PTP@arri.net

NPARC Takes Part in N.P. Memorial Day Parade

It wasn't a bright, sunny day, but at least it didn't rain on Our Parade this Memorial Day Monday.

As in numerous prior years, our club was represented and took part in the parade. Just how many years have we been in the parade?

Compared to prior years, we had a decent number of club members taking part, though we would have welcomed more members; of course.

Our group, along with the club banner, walked the parade route down Springfield Ave., through the center of town; where we received a warm welcome from the home town folk ! After the parade, members visited the American Legion Post or the DeCorso Comm. Center; where refreshments were provided.

Thanks to the following members who took part in the parade this year: Al Hanzl, K2AL; Andy Meyer, N2FYE; Bob Willis, K2GLS; David Bean, KC2WUF; Don Young, N2SLS; Jim Stekas, K2UI; Paul Wolfmeyer, W2PTP; Sam Sealy, KC2OSR; Tim Farrell, KD2EKN; and Rick Anderson, WB2QOQ. Also thanks to Barry Cohen, K2JV, photographer; and Frank McAneny, K2EZR; along with Guy Brennert, K2EFB, parade route communicators.

Rick, WB2QOQ

I will try to have a picture next month. K2EZR

Selecting Variable Transmitting Capacitors

Jim Stekas - K2UI

Variable capacitors are one of the essential building blocks of antenna tuners. When selecting a capacitor for your tuner the critical specifications to consider are maximum capacitance and breakdown voltage rating.

The maximum capacitance required will depend on bands to be covered and the range of impedances to be matched. If you are building your own tuner from a published design, capacitor values will be provided, but there is usually some flexibility. If a 250pf capacitor is specified, a 350pf capacitor from the junkbox will work just fine. You could also get away with a smaller value if you aren't tuning down to the lowest design frequency. If the tuner design covers 80-10m and you never go below 40m, you should be able to get away with a 125pf capacitor instead of the 250pf specified in the design.

The breakdown voltage required will depend on the transmit power, tuner design and SWR to be matched. Breakdown voltage is primarily a function of the width of the air gap between the plates of the capacitor, and secondarily a function of air pressure and humidity. Sharp edges and bent plates can lower a capacitor's breakdown voltage, so most capacitor breakdown ratings are specified conservatively.

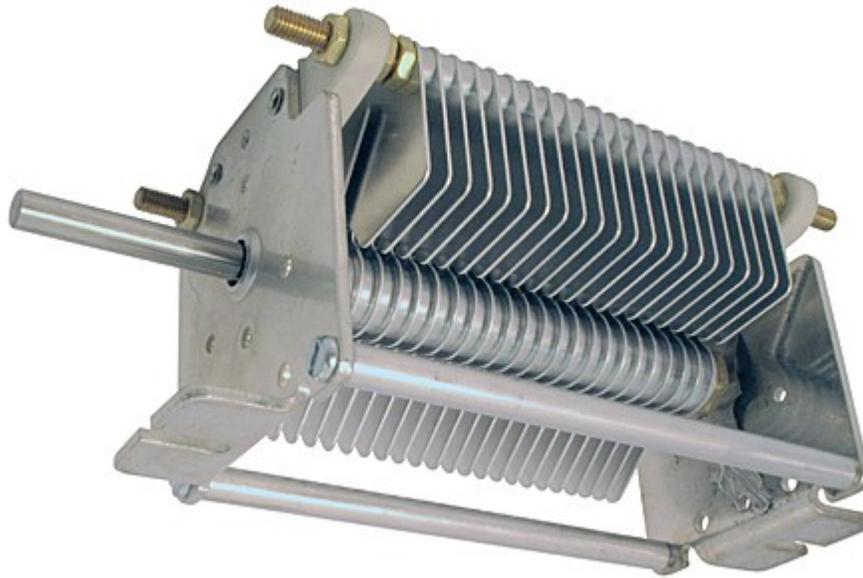
If you are copying a 1KW design but you only run 100W you can safely use a capacitor with a lower breakdown voltage rating. For a reduction in power by a factor of 10, the breakdown voltage rating may be reduced by a factor of $3 \approx \sqrt{10}$.

Power (W)	Min Breakdown Voltage (V)	Min Air Gap Width (in)
10	800	0.023
100	2500	0.066
200	3500	0.100
450	6000	0.171
750	7000	0.200
1000	10000	0.290

The table above shows suggested capacitor breakdown voltage ratings as a function of power. I derived this table from specifications found in the 1935 Cardwell catalog. The nominal breakdown voltage of air is 75KV for a 1" gap. Table values have healthy safety margin.

Hamfests are a great place to find quality air variable capacitors at reasonable prices. You can usually find the maximum capacitance stamped on the capacitor. As far as breakdown voltage goes, you will need to estimate the air gap between plates when fully meshed. A dime is 0.05" thick and provides a handy reference. If you can fit 2 dimes between the plates the gap is 0.1" and the capacitor is good for 200W.

The picture below shows a typical air variable capacitor that you will find at hamfests. At the top are the stator (non-moving) plates which are insulated from the frame. The rotor plates are mounted on a shaft that makes mechanical and electrical contact with the frame. When mounted to the chassis, the rotor is at chassis ground.



Most capacitors will have a ball bearing in front to support the shaft. In the back, the shaft is held mechanically by an adjustable plain bearing and a spring wiper is used to make a good electrical to the frame ground. Before laying out cash for a capacitor make sure the shaft rotates freely without binding and rotor makes a good electrical collection with the frame. The plates should be straight and evenly spaced and there should be no contact between stator and rotor plates. (A DVM would be a handy for checking continuity.)

If you are buying a capacitor for a small loop antenna it's best to avoid a single section capacitor like the one above. Small loops have very low radiation resistance and the wiper connection is a potentially serious source of loss. A better solution for a loop antenna is a dual section capacitor (below). Leave the rotor floating and make connections to the two stators. This puts the two capacitor sections in series with the rotor providing the connection between them. In such an arrangement the wiper connection is completely out of the picture and all connections soldered. The down side of this approach is that the total capacitance is only half the capacitance in each section, but the breakdown voltage gets doubled.

