

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 54 NO. 9 September 2019

Regular Meetings

**10/11 & 10/25 Monday 7:30
DeCorso Community Center**

Upcoming Events

This year's TCS New York City Marathon is set for Sunday, November 3, 2019.

Contact Tim Farrell, KD2EKN, for full information.

Annual Holiday Luncheon

Chimney Rock 12/7

Meeting Schedule

Regular Meeting: 7:30—9:00 PM
**2nd & 4th Monday
of each month** at the
NP Senior & Adult Center
15 East Forth Street
New Providence

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

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Editor: K2EZR Frank McAneny

Contributing Editors:

WB2OOO Rick Anderson

W2PTP Paul Wolfmeyer

K2UI Jim Stekas

Climatological Data for New Providence August 2019

The following information is provided by
Rick, WB2OOO, who has been recording daily
weather events at his station for the past
38 years.

TEMPERATURE -

Maximum temperature this August, 88 deg. F
(August 18)

Last August (2018) maximum was 91 deg. F.

Average Maximum temperature this August,
81.2 deg. F

Minimum temperature this August, 61 deg. F
(August 26)

Last August (2018) minimum was 60 deg. F.

Average Minimum temperature this August,
68.8 deg. F

Minimum diurnal temperature range, 6 deg.
(79-73 deg.) 8/13

Maximum diurnal temperature range, 19 deg.
(83-64 deg.) 8/12

Average temperature this August, 75.0 deg. F

Average temperature last August, 76.6 deg. F

Maximum daily temperature of 90 degs. or
higher - 0 days this August;

5 days last August.

PRECIPITATION -

Total precipitation this August - 4.09" rain

Total precipitation last August - 8.48" rain

Maximum one day precip. event this August -

August 7, 1.65" rain

Measurable rain fell on 10 days this August,
15 days last August.

YTD Precipitation - 46.99"

Rick Anderson

9/5/19

243 Mountain Ave.

New Providence, NJ

(908) 464-8911

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 September 2019

Our thanks to Ria N2RJ, our Hudson Division Director, for the excellent talk she gave the club at our September 9 meeting. The presentation was on Software Defined Radio (SDR) technology, titled "2019 State of SDR."

The nomination process for club officers for 2020 is underway. We thank Guy Brennert K2EFB for leading the nominating process for a number of years; he has asked to retire. Our new committee is Tim Farrell KD2EKN and David Bean KC2WUF. Please let them know of your interest in an officer position and/or respond to them when asked. Elections will be the second meeting of November.

Al Hanzl K2AL is putting together an order for shirts, hats, badges...Please respond to his item on the reflector if interested and SOON!!. The "start list" was put together at the September 23rd meeting, so this note is primarily a message to those who missed the meeting.

Future dates:

December 7—first Saturday in December—our holiday party!
Saturday February 22—our annual auction.

73 for now

Wolf W2PTP, 201-404-6914, w2ptp@arrl.net

Congratulations



"K2AL celebrates 50 years in ham radio in May. " First licensed in May of 1969 as WN2JVO (WB2JVO a year later), an anniversary dinner celebration was held at Coppola's in New Providence.

Celebrating with Al were his wife Kathy and daughters Erin and Lauryn (W2OLF) and his brother Ken, W2IOC, and sisters Joan and Kathy and their spouses.

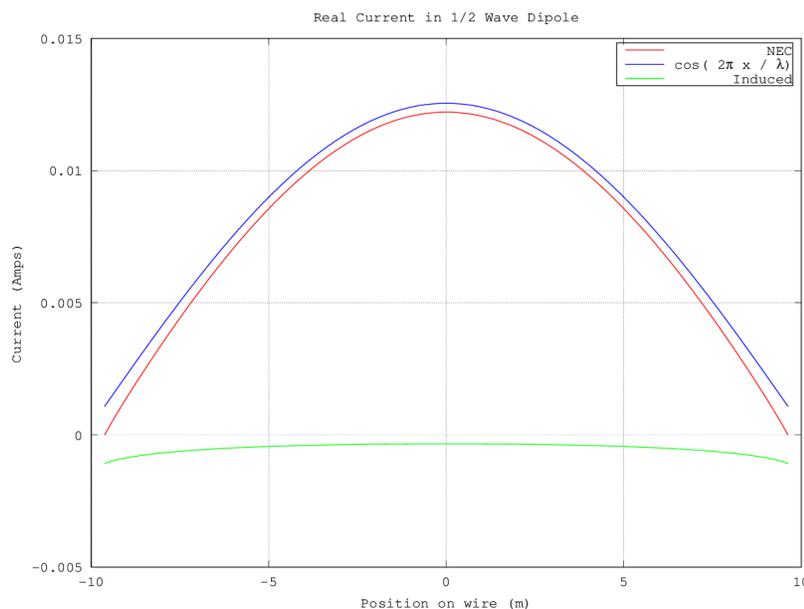
The Half Wave Dipole

Jim Stekas - K2UI

An “antenna” is basically a metal structure that will radiate electromagnetic waves when driven by an RF current (or voltage). If an antenna does this efficiently it is a “good antenna” while one that doesn't is a “bad antenna”. In general one will find that the “good antennas” tend to be constructed from one or more resonant half-wave dipoles.

If we excite a wire with RF energy traveling waves of voltage and current will run along the wire, bouncing back and forth from end to end. A wave leaving end #1 will travel to end #2, be reflected, travel back to end #1, and be reflected again. In one cycle, the wave travels the length of the wire twice, and is reflected twice. For the wire radiate efficiently, it must resonate at the transmit frequency, meaning the waves must return to the same phase after every cycle.¹ Therefore they must travel an integer multiple of wavelengths per cycle. Since the wire is traversed twice per cycle, the wire must be an integral number of $\frac{1}{2}$ wavelengths. So the shortest resonant wire antenna is $\frac{1}{2}$ wavelength – the ubiquitous half-wave dipole.

At resonance, a dipole will have large voltage and current standing waves that generate the radiated E&M fields. Resonance causes the radiated fields from the two legs of the dipole to re-enforce each other. This is precisely the opposite of a transmission line where the two conductors generate canceling radiated fields.

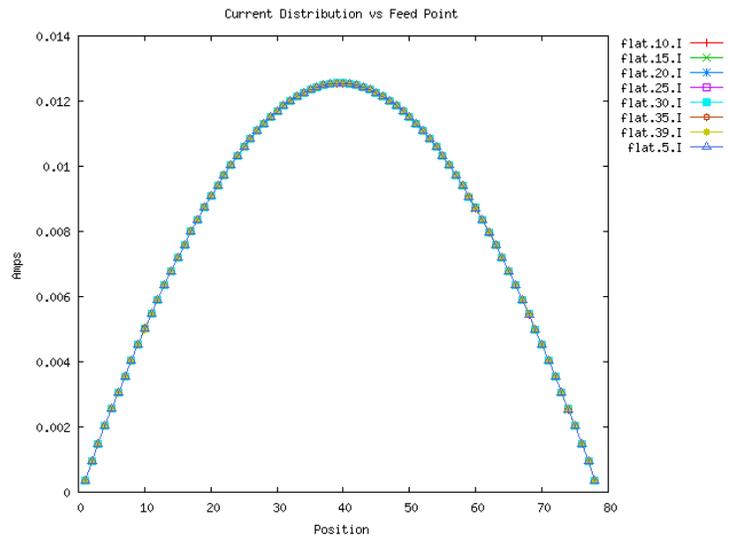


A linear half-wave dipole will resonate when its length is approximately 95% of a half-wave in free space, due to “end-effects”. The plot below shows the current distribution (red) on a half-wave dipole as modeled in NEC. The blue line shows an approximate current going like $\cos\left(\frac{2\pi x}{\lambda}\right)$ that is often used to estimate antenna patterns and impedance. But this current will induce additional currents in the wire (green) that are not zero at the ends of the wire. If we make the antenna 5% shorter than $\frac{1}{2}$ wave, we can add the “blue” and “green” to cancel the currents at the ends of the wire, and get the NEC result (red).

¹ Reflections can change the phase of a wave by +/- 1, but since there are two reflections per cycle they cancel each other out. Voltage waves have a reflection coefficient of +1 while current waves have a reflection coefficient of -1, forcing current to be zero at the ends of a wire.

Off-center fed dipoles have become popular for multiband work. The figure at the right shows current distributions over the length of the wire for 100W input at various feed points. Note that current is independent of the where the dipole is fed. This goes for end-fed dipoles as well although getting an efficient match would be a challenge.

Note: at any feed point the impedance will be $R = \frac{P}{|I|^2}$.



A half-wave dipole is a very robust antenna. Legs of the dipole don't have to be linear and straight. The ends of the dipole can “droop” and the legs could be at 90 degrees if needed and it will still radiate well. Resonant frequency and input impedance will vary with geometry, but not in a pathological way. Start with a dipole 10% longer than needed, trim it to frequency, and you'll have a “good antenna” on the cheap.