

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)**

April 2024

Volume 57 No. 4

Regular Meetings

Second & Fourth Mondays

Apr 8 - Business Meeting at SBS (no Zoom)

Apr 22 - Meeting at SBS & Zoom.

Upcoming Events

Check Reflector & www.nparc.org for details.

Digital Net Mondays at 9 PM – 28.086 MHz (+/-)

CW Net, Thursdays at 9 PM – 28.050+QRM

Meeting Schedule

Regular Meeting: 7:30—9:00 PM
**2nd & 4th Monday
of each month**
Watch for Emails

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 2024

President: K2UI, Jim Stekas
908-868-4970
Vice President: W2EMC Brian DeLuca
973-543-2454
Secretary: K2AL: Al Hanzl
908-872-5021
Treasurer: K2YG Dave Barr
908-277-4283
Activities: KC2OSR, Sam Sealy
973-635-8966

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
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 K2AL, Al

MOUNTAIN SPARK GAPS

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Acting Editor: K2UI Jim Stekas
Contributing Editors:
WB2QOQ Rick Anderson

Climatological Data for New Providence - January 2024

The following information is provided by Rick, WB2QOQ,
who has been recording daily weather events at his station
for the past 43 years.

TEMPERATURE -

Maximum temp. this February, 58 F (Feb 28)
Last February(2023) maximum was 66 F.
Average Maximum temp this February, 42.9 F

Minimum temp this February, 18 F (Feb 18,25)
Last February(2023) minimum was +3 F.
Average Minimum temp this February, 28.6 F

Minimum diurnal temp range, 6 F (47 - 41 F) 2/11
Maximum diurnal temp range, 24 F(57 - 33 F) 2/27

Average temp this February, 35.8 F
Average temp last February, 37.3 F

PRECIPITATION -

Total precipitation this February –
1.92” rain/melted snow, 10.2” snow
Total precipitation last February –
1.50” rain/snow melt; 1.8” snow

Maximum one day precip. Event - February 27, 0.30” rain.
February 13, 6.2” snow

Measurable rain fell on 6 days this February
7 days last February.

YTD Precipitation – 7.61”

=====
Rick Anderson 3/14/2024
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

Spring is upon us at long last and the cherry tree blossoms are beginning to pop. The days are warmer and longer and the trees are mostly bare making it a perfect time to make antenna improvements. Time to make ready for those 10m openings lasting late into the night.

NPARC made appearances at STEM night at the Salt Brook School and Makers Day at the Chatham Library. For many years we have tried to spark interest in ham radio among kids with very little to show for it. In a world of TicTok we have at most 5 seconds to capture a kid's attention and perhaps maintain it for the next 30 seconds. Else, it's on to the next thing.

“Insanity is doing the same thing over and over again and expecting different results.” is an aphorism attributed to Albert Einstein¹. If we are going to recruit a new generation of young hams we need a new approach. It's hard to know what would work, but all empirical evidence indicates that Kid's Day isn't working. I don't have the answer, but I am very willing to try new approaches. Any ideas?

73,

Jim – K2UI

1 - It more than likely originated with author Rita Mae Brown, but association with Einstein gives it more gravity.

Popular Contests in April 2024

Dave Barr – K2YG

Contest Name	Dates	Mode	Exchange	Notes & Websites
EA RTTY Contest	4/6 Sat 8am to 4/7 Sun 8am	RTTY	EA: rst+province non-EA: rst + #	QRP/LP/HP 80 thru 10 concursos.ure.es/en/earthy/bases/
Missouri QSO Party	4/6 Sat 10am -12m 4/7 Sun 10am-4pm	CW Phone Digital	MO: rs(t)+county Non: rs(t)+st/pro	QRP/LP/HP 160-10, VHF-UHF www.w0ma.org/index.php/missouri-qso-party
Mississippi QSO Party	4/6 Sat 10am-10pm	CW SSB RTTY FT4/8	MS: rs(t)+county Non: rs(t)+st/pro FT#: sig+grid sq	No Power Categories 160 – 2 meters www.arlmiss.org/
Louisiana QSO Party	4/6 Sat 10am-10pm	CW/Digital Phone	LA: rs(t)+parish Non: rs(t)+st/pro	QRP/LP/HP 160-2 meters laqp.louisianacontestclub.org/
SP DX Contest	4/6 Sat 11am to 4/7 Sun 11am	CW SSB	SP: Prov (1 let) Non: rs(t)+serial	QRP/LP/HP 160-10 meters spdxcontest.pzk.org.pl/2024/rules.php
Sol Eclipse QSO Party	4/8 Mon 10am-8pm	CW Phone Digital	RS(T) + 4-char grid square	No Power Categories 160 – 6 meters hamsci.org/seqp-rules
IG-RY RTTY	4/13 Sat 8am to 4/14 Sun 2pm	RTTY	RST + 4 digit year 1st licensed	LP/HP 80-10 meters www.ig-ry.de/ig-ry-ww-contest
New Mexico QSO Party	4/13 Sat 10am to 10pm	CW Phone Digital	NM: rs(t)+county Non: rs(t)+st/pro	QRP/LP/HP 160-2 meters www.newmexicoqsoparty.org/
North Dakota QSO Party	4/13 Sat 2pm to 4/14 Sun 2pm	CW Phone RTTY/PSK	ND: rs(t)+county Non: rs(t)+st/pro	No Power Categories 160 – 2 meters ndarrlsection.com/ 2024/2024_ND_QSO_Party_Rule.pdf
Georgia QSO Party	4/13 Sat 2pm-12m 4/14 Sun 10am-8pm	CW SSB	GA: rs(t)+county Non: rs(t)+st/pro	QRP/LP/HP 160-6 meters gagsoparty.com/
CQMM	4/20 Sat 5am to 4/21 Sun 8pm	CW	RST+cont abbrev EX tags: see web	QRP/LP/HP 80-10 meters www.cqmmdx.com/rules/
Nebraska QSO Party	4/20 Sat 7am to 4/21 Sun 7pm	CW Phone Digital FT#	NE: County Non: State/Prov See web for FTs	QRP/LP<150/HP 160-10m VHF-UHF nebraskaqsoparty.com
Michigan QSO Party	4/20 Sat 12n-12m	CW SSB	MI: rs(t)+county Non: rs(t)+st/pro	QRP/LP/HP 80-10 meters miqp.org/index.php/rules/
Ontario QSO Party	4/20 Sat 2pm-1am 4/21 Sun 8am-2pm	CW Phone	ON: rs(t)+county Non: rs(t)+st/pro	QRP/LP<150/HP 160-2 meters www.va3cco.com/oqp/rules.htm
Quebec QSO Party	4/21 Sun 8am-6pm	CW Phone	QC:rs(t)+qczone Non: rs(t)+st/pro	QRP/LP/HP 160-2 meters wp1.quebecqsoparty.org/
SP DX RTTY	4-27 Sat 8am to 4-28 Sun 8am	RTTY	SP:rst+prov code Non:rst+serial#	QRP/LP/HP 80-10 meters www.pkrvg.org/strona.spdxrttyen.html
Florida QSO Party	4-27 Sat 12n-10pm 4-28 Sun 8am-6pm	CW Phone	FL: rs(t)+county Non: rs(t)+st/pro	QRP/LP/HP 40-10 meters floridaqsoparty.org/rules/
BARTG Sprint 75	4-28 Sun 1pm-5pm	RTTY 75 baud only	Serial Number	QRP/LP/HP 80-10 meters bartg.org.uk/wp/bartg-sprint75-contests/

- Check www.contestcalendar.com or contest specific websites for more information on these and many other radio contests.
- State QSO Parties require out-of-state stations to contact only in-state stations. In-state stations may contact any station. See websites for rule and county abbreviations.

Stem Night at Salt Brook School

Don Madson - K2DAM

New Providence Amateur Radio Club was invited to present facets of our activities at the annual STEM night at Salt Brook School. Jay Morreale (KD2ZRO), Kevin Glynn (N2TO) myself, Don Madson (K2DAM) arrived at about 6:30pm and were led to the gymnasium, where a table in a corner position was provided.

Jay assembled his intricate Raspberry Pi exhibit/demonstration, Kevin set up a CW sending station (utilizing his HF radio that he brought), and I set up my UHF/VHF station, with my Yaesu FTM6000, a copper J-Pole antenna, and a Bienco battery.



Jay's end of the table was an immediate hit, with groups of students and their parents clustered around him while he explained, demonstrated, and taught how it operated. Kevin and I were pretty busy, too, with Kevin having several students learning how to transmit their names with the CW key.



Due to the cooperation of Billy Malone (KD2JRI), Sam Sealy (KC2OSR), and Brian DeLuca (W2EMC), students were able to apply the ideas of local communication, as our club members enthusiastically acted as conversation partners for the students manning the microphone in the gym.



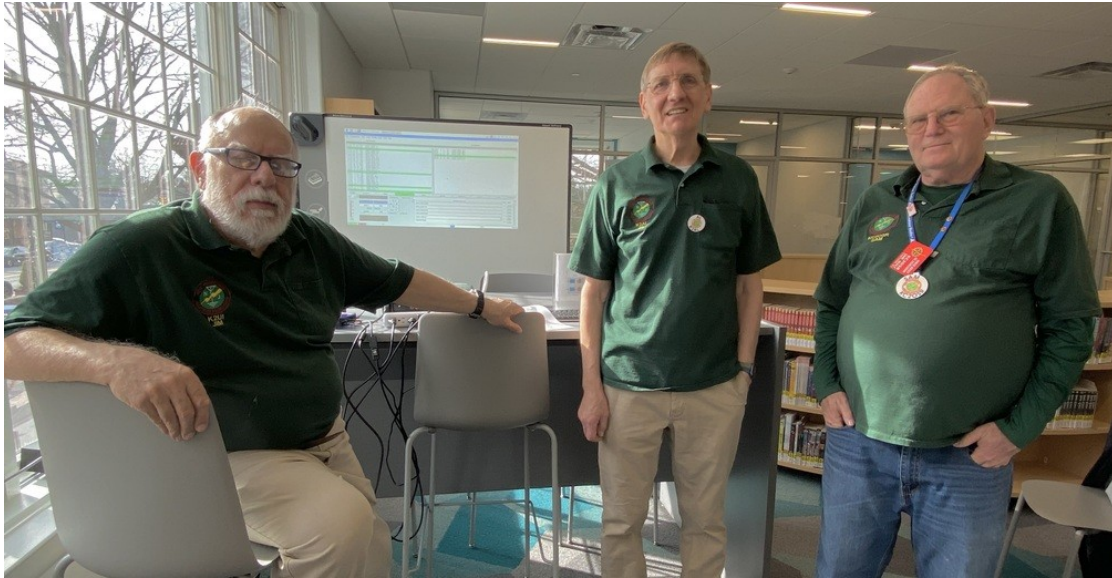
The event was highly energetic, and the event was a great showcase of STEM work by the student body. The principal was gracious and complimentary about our contribution to the evening, and hoped that we could collaborate again.



Makers Day at Chatham Library

Jim Stekas - K2UI

Friday, March 15, was Makers Day in at the Chatham Library². NPARC was invited to participate and demonstrate applications of the Raspberry Pi in amateur radio. The NPARC maker team was composed of Jim (K2UI), Al (K2AL), Sam (KC2OSR) and Dave (K2YG).



At the library we set up for digital communications with a 40m OCF, IC-7300 transceiver, Raspberry Pi4, and the club video projector. WSJT-X can be seen in JT8 mode displayed on the screen in the image above. We also ran *fldigi* for PSK communications with K2YG who was standing by in his shack in Summit. K2AL left his WSPR beacon on in his shack and we displayed a world map of spots where his 200mW signal was received.

Murphy threw us some curve balls, but the biggest problem we faced was attracting an audience. The bulk of the maker activities were in the basement and there was almost no maker foot traffic on the main floor where we were located. A couple of boys came by and worked K2YG on PSK, but they soon lost all interest in ham radio when they noticed the roomful of girls knitting in an adjacent room.



Zero Bandwidth CW

Jim Stekas - K2UI

Claude Shannon proved that the bandwidth needed to transport a signal is proportional to the information in the signal. CW signals are created by turning a continuous sine wave on and off. Not much information is contained in those few dits and dahs in an exchange, so not much bandwidth is required. In fact, I often receive no information at all copying a CW signal, which motivated me to think that it might be possible to send CW signals in a 0Hz bandwidth. The benefits of zero bandwidth modulation are so enormous that I give free license to all to use my discovery.

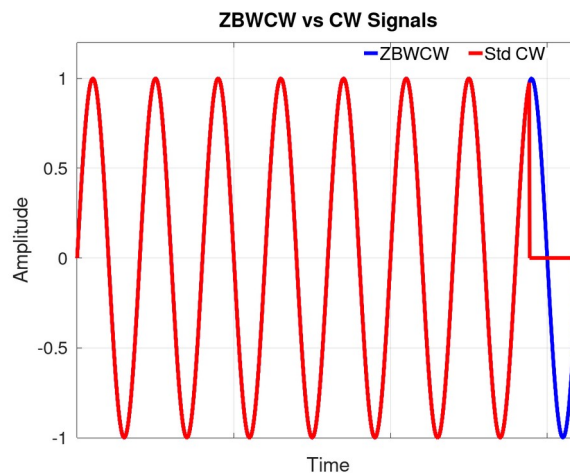
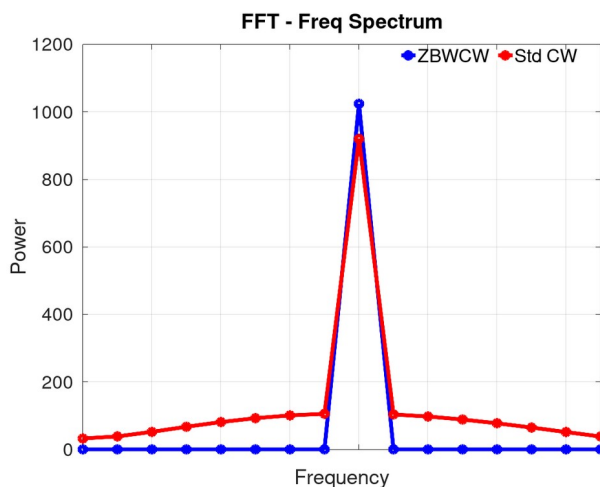
I came up with the following scheme to send 0Hz bandwidth CW signals, which I will call ZBWCW. The key feature of the RF sine wave we will exploit for ZBWCW are the zero crossings. ZBWCW is generated by:

- starting all dits and dahs on a $V < 0$ to $V > 0$ zero crossing, and
- ending all dits and dahs on a $V > 0$ to $V < 0$ zero crossing.

In this way, we generate ZBWCW signals composed of integral numbers of complete sine wave cycles. Since all on/off transitions occur at $V=0$, there are any discontinuities in the signal that would generate higher bandwidth signal components would be at zero power and have no negative consequence. For a 7MHz signal, zero-crossings occur every 71nsec, so there is not impact on the copy-ability of the signal from waiting up to 71nsec for the next zero crossing to implement a key up or down.

The figure at right shows the time evolution of a standard CW signal (red) at the end of a dit or dah. The RF signal drops abruptly to zero, and the slope (derivative) is discontinuous.

In ZBWCW (blue) the RF does not turn off until the zero crossing. So any discontinuous behavior occurs when power is zero.



At left the spectra of both signals are shown. The standard CW signal is spread out in frequency due to the sharp cutoff of the signal. In contrast, the ZBWCW spectral power all falls in a single FFT bin. We can decrease the FFT bin width by using more samples in the FFT. In the limit of an FFT with infinite samples, the signal will be contained in a bin of zero width, the equivalent of a delta function.

Thus zero bandwidth modulation is achieved.