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 55 No. 1 January 2022

Regular Meetings

Second & Fourth Mondays
2/14/22 Salt Brook School Cafeteria
(Same location as last auction)
2/28/22 Zoom

Upcoming Events

Digital Net Mondays at 9:00 PM
PSK on 80 or10 meters
CW training Net, Thursday at 9:00 PM
Watch for Email announcements.

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 2022

President: W2PTP Paul Wolfmeyer
201-406-6914
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
973-462-2014

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 K2JV, Barry

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W2PTP Paul Wolfmeyer
K2UI Jim Stekas

Climatological Data for New Providence for December 2021

The following information is provided by Rick, WB2QOQ, who has been recording daily weather events at his station for the past 40 years.

TEMPERATURE -

Maximum temperature this December, 63 deg. F (December 11)
Last December(2020) maximum was 60 deg. F.
Average Maximum temperature this December, 46.1 deg. F
Minimum temperature this December, 23 deg. F (December 20)
Last December(2020) minimum was 15 deg. F.
Average Minimum temperature this December, 34.3 deg. F
Minimum diurnal temperature range, 4 deg. (50 - 46 deg.)12/31
Maximum diurnal temperature range, 22 deg. (62 - 40 deg.)12/11

Average temperature this December, 40.2 deg. F
Average temperature last December, 35.2 deg. F

PRECIPITATION -

Total precipitation this December- 1.61" rain/snow melt; 0.2" snow
Total precipitation last December- 3.92" rain/snow melt; 5.5" snow

Maximum one day precip. event this December-

December 29, 0.37" rain.
Measurable rain fell on 12 days this December,7 days last December.
Measurable snow fell on 1 day this December.

YTD Precipitation - 55.60"

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Rick Anderson
1/15/2022
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 January 2022

Our plan to go to hybrid/in person for the first meeting of the month was side-tracked as Covid numbers went up, so we had a ZOOM for our first meeting of January. Hopefully, our meeting on February 14th will be hybrid/in person at Salt Brook School—but stay tuned.
At our second meeting of January (planned and held on ZOOM), attendees voted overwhelmingly to proceed with the Auction on February 26th…more on that later…James Kern KB2FCV presented a program on satellites--background, what you need to get involved, and his own setup. His slides were distributed on the reflector and the link to a recording of the program was sent by me on Tuesday (it will be available for a couple of weeks). Thanks James for the fine program!
Back to the auction—the framework agreed to is: at Salt Brook School Saturday February 26th, (no snow date,) door open at 1PM, auction starts at 2PM, admission $10, no commission on sales, drinks available (no food), masks required.
As agreed, we released publicity starting Tuesday February 26th (thanks mostly to Al K2AL). And our website is posted—thanks David KC2WUF. I have posted the auction on the ARRL hamfest website—thanks for Ria's quick approval. There will be door prizes, too.
A number of folks volunteered for auction roles at the meeting. I will put together a spreadsheet that we will, hopefully, complete at our February 14th meeting.

So we are "off and running"—hopefully headed for success….(similar to 2020!!)

Upcoming programs (thanks Sam), for your information:

February 28 Zoom: VU2RBI: Ham radio in India. See her bio on QRZ.com.
March 28 Zoom: Tim Duffy, K3LR: Stealth antennas.
April 11 via Zoom: W9JJ, Bart Jahnke: ARRL Logbook of the World (LoTW)

Ok, try the NPARC nets—phone on Sunday, digital on Monday (it's hitting 7 or 8 attendees regularly) and CW on Thursday (break out that key and dive in).

73
Wolf W2PTP
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Voltmeter Basics

Jim Stekas - K2UI

A voltmeter is an indispensable tool that should be in every ham's toolkit. The first step in basic troubleshooting homebrew and commercial gear is comparing measured power supply and bias voltages against what is specified in the schematic, then identifying any significant discrepancies, and finally figuring out what caused them.

Digital voltmeters (DVMs) have largely displaced analog meters because they have better price/performance and are more convenient to use in most applications. DVM prices vary from $0 (Harbor Freight freebies) to >$1000 for calibrated laboratory grade instruments.

Let's look at the critical specs of a DVM using my Velleman DVM9912 as an example. It is fairly typical of DVMs selling on Amazon for $20-$50 good enough for most ham shack applications.

Maximum Voltage specifies the highest voltage a DVM may be used for without the risk of shocking the operator through the case. The Velleman, and most low cost DVMs, have at least a 600V rating. This is adequate for working on 100W solid state rigs but you will want something better for working on tube rigs and amplifiers.

Counts is the maximum number that the DVM will display and is related to the number of bits output by the digital-to-analog converter (DAC). The Velleman will display a maximum of 4000 counts, meaning that the next higher value greater than 3.999v will be displayed as 4.00v. My Harbor Freight freebie only goes up to 2000 counts and will display 3.999v as 4.00v. Both of these displays have 3 least significant digits displaying the full range from 0-9 and a high order digit with a limited range. Both DVMs are said to have 3 ½ digit displays even though the Velleman has twice the precision of the Harbor Freight.

Voltage Resolution is the ability to distinguish small voltage differences with successive measurements and is limited by the number of digits displayed. For the Velleman it is ± 2 in the last digit, equating to $3.000 \pm .002\,V$ and $4.00 \pm 0.02\,V$.

Voltage Accuracy is specified as $\pm 0.5\%$ of the displayed voltage, plus the voltage resolution error of ± 2 in the last digit.

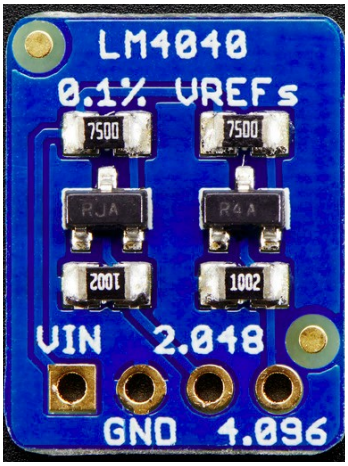
Input Impedance is $7.8\,M\Omega$. This is high enough to prevent loading of the circuit being measured in most cases. $11\,M\Omega$ is typical of the input impedance of a CMOS transistor and is a practical upper limit on input impedance.

Measurement Rate of the Velleman is 2 times per second. The voltage being measured must be stable for more than one second to get a stable measurement.

Auto-Ranging is a feature of the Velleman DVM. It will adjust its maximum range automatically from 0.4 to 600 V to show the measured voltage at maximum resolution. This is a handy convenience, but it will often take many measurements to select the proper range. So a measurement could take as long as 2-3 seconds top stabilize. For quick measurements over a wide voltage range (e.g. 1.0-399.9 V) a good DVM will allow the auto-ranging to be overridden, trading resolution for speed.

Other Features provided by the Velleman include DC current, AC voltage and current, resistance, *capacitance*, *frequency*, temperature, *duty cycle*, and diode test. This list is fairly typical of most low cost DVMs. Quantities in *italics* generally have a useful but limited range.

Quality is not something you will find quantified in a spec sheet, but you may consider price as a good indicator of quality and reliability. I have had a number of bargain DVMs fail on me, but I work in my shack where I have plenty of backups on hand.[1] But a professional technician poking around an equipment rack at some remote customer site needs one DVM that will work every time. That's why the pros are willing to spend $600 on a Fluke multi-meter that will last 20 years.



If you have a cheap DVM (or two) and are wondering about how accurate it really is, there is a cheap way to check. Adafruit makes an LM4040 breakout board smaller than a postage stamp that provides voltage references at 2.048 V and 4.096 V. The LM4040 chip uses some fancy band gap techniques to generate a voltage reference accurate to $\pm 0.1\%$ over a wide temperature range. The cost is only $8.

Check it out at: https://www.adafruit.com/product/2200

I used the Adafruit board and a 9V battery to build a voltage reference in an Altoids tin. A momentary On switch prevents accidentally leaving the power on.

1 Thank-you Harbor Freight!