

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)**

**Regular Meetings
Second & Fourth Mondays
1/13 & 1/27**

**Upcoming Events
Annual Auction & Flee Market
Feb. 25**

**Digital Net Mondays at 9:00 PM
PSK on 80 or 10 meters
CW training Net, Thursdays at 9:00 PM**

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 2023

President: K2UI, Jim Stekas
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: KC2MTN, John Zellhofer
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 KC2WUF, David

MOUNTAIN SPARK GAPS

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Contributing Editors:
WB2QOQ Rick Anderson

Climatological Data for New Providence for December 2022

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 temperature this December, 57 deg. F
(December 7)

Last December (2021) maximum was 63 deg. F.

Average Maximum temperature this December, 41.0 deg. F

Minimum temperature this December, +4 deg. F
(December 24)

Last December (2021) minimum was 23 deg. F.
Average Minimum temperature this December,

26.6 deg. F

Minimum diurnal temperature [range, 5 deg. \(37](#)

[-32 deg.\) 12/11; \(42-37\) 12/16](#)

Maximum diurnal temperature range, [49 deg.](#)

[\(55-6 deg.\) 12/23](#)

Average temperature this December, 33.8 deg. F

Average temperature last December, 40.2 deg. F

PRECIPITATION -

Total precipitation this December- 5.26" rain

Total precipitation last December- 1.61" rain; 0.2" snow

Maximum one day precip. event this December-

[December 23, 1.33" rain.](#)

Measurable rain fell on 9 days this December, 12 days last December.

YTD Precipitation - [47.33"](#)

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Rick Anderson

1/10/2023

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

Let's begin 2023 by acknowledging what a great job Paul Wolfmeyer, W2PTP, during his six year tenure as NPARC President. Thanks Paul, enjoy your newfound freedom. May your skinned knuckles heal quickly and may you never run out of GOJO.

For our first technical meeting of the year we enjoyed excellent presentations on POTA (Parks On The Air) from Kevin Glynn, N2TO, and Brian DeLuca, W2EMC. NPARC always struggles to find speakers for our technical meetings on the fourth Monday of each month and the POTA presentations should remind of the considerable talent and expertise of NPARC members.

This year we will try to leverage our internal talent in two ways:

Encourage (harass?) members to develop a presentation or activity for a technical meeting. Contact John Zellhofer, KC2MTN, if you have a good presentation topic.

Identify elmers within the club who members could reach out to for help in certain areas: WSJT, HOA antennas, fldigi, LOTW, contesting, antenna raising, etc. If you have a particular skill that could help others let us (K2UI or K2AL) know what it is. We will create a list of elmers to support members looking for help.

73,

Jim - K2UI

Useful Measurements from Your S-Meter

Jim Stekas - K2UI

When giving a signal report, the S-meter provides an objective signal strength measure, albeit a rather meaningless one. My Icom IC-7300 has a very stingy S-meter and I can routinely copy signals that don't even register on the S-meter. But there is no way I can bring myself to give a 509 signal report, so I will fudge the signal strength and give a 549. If K2AL is reporting 589, I'll push it up a little more, say 569. I felt my fudged signal reports give a better characterization of the signal coming from the transmitting station than the S-meter.

The International Amateur Radio Union (IARU) has specified the proper calibration of S-meter readings. S9 is defined as an input signal of $50\mu V$, or -73 dBm. Each change of one S-unit represents a change of input voltage by a factor of 2x, or 6 dB. It probably won't surprise you to learn that S-meter calibration of popular HF transceivers is all over the place. (See below)

S-Meter Calibration Test Summary of popular HF transceivers												
<i>Conducted on laboratory test bench using R&S SMA100A Signal Generator, HP/Agilent Coax Attenuator HP8491A & HP11708A and Tektronix VNA (s9=50uV=-73dBm, s1=0.2uV=-121dBm -6dB/S-unit) Measurements conducted @ 25 degC ambient after 60 mins warmup</i>												
IARU Standard	S1	S2	S3	S4	S5	S6	S7	S8	S9	+20	+40	+60
IC-746Pro	x	x	x	x	S1	S2	S2.9	S5	S9+6	+31	+46	x
IC-756ProII	x	x	x	S1	S1.6	S3.8	S5.6	S7.9	S9	+20	+41	+59
IC-706	x	x	S1	S2.2	S5	S5.7	S6.8	S8.1	S8.9	+8	+18	+36
IC-718	x	x	x	x	S1	S3.4	S6.8	S7.4	S8.5	+17	+32	+45
IC-735	x	x	x	x	S1	S3	S4.1	S7.2	S8.7	+25	+39	+59
IC-765	x	x	x	S1	S2	S4.9	S5.9	S8.1	S9+2	+19	+39	x
TS-440	x	x	S1.4	S1.9	S2.8	S4	S5.5	S7.7	S9	+16	+33	+48
TS-830	x	x	x	S1	S1.6	S4	S5.5	S7.8	S8.9	+15	+30	x
TS-590SG	x	x	S1	S1.4	S1.8	S4.6	S6.8	S8.3	S9	+22	+45	x
TS-990S	x	x	S1	S1.5	S2	S4.5	S6.7	S8.1	S9	+23	+42	+60
TS-2000	x	x	x	S1	S1.5	S4.1	S6.8	S8.2	S9+2	+24	+46	x
FT-891	x	x	x	S1	S2.2	S4.2	S5.9	S7.4	S9	+21	+40	+57
FT-920	x	x	x	S1	S1.8	S4.2	S6.4	S7.6	S9+1	+23	+46	x
FT-991A	x	x	x	S1	S2	S4.5	S6.8	S8.2	S9+4	+25	+47	x
IC-7300	x	x	x	x	S1	S2.8	S5.1	S7.6	S9+1	+19	+38	+54

Presented by Basu VU2NSB

I can't vouch for the accuracy of the above table from VU2NSB, but there are some qualitative features that stand out:

1. The S9 reading on most transceivers is fairly close to -73 dBm, the IARU spec.
2. S-unit spacing is generally far less than the 6 dB called for by the IARU resulting S-meter readings that are too low for signals weaker than S9.

Measurements on my IC-718, IC-7300, and IC-7610 are very consistent with S9 = -73 dBm, and each S-unit representing a 3 dB change in signal strength. That translates into a reading of S1 for an IARU signal of S5, so my RST fudging is supported by the data.

The motivation for making these measurements was variability in received signal levels during the NPARC digital and CW nets on 10 meters. The strength of signals varies wildly due to propagation distance, topography¹, and aircraft multipath scattering. Also contributing are locally controllable factors: antenna problems (e.g. intermittent connections) and receiver sensitivity. One week a station might be easily copied with a healthy display on the waterfall while the following week it would be a challenge to copy with a weak appearance on the waterfall.

With the warranty on my IC-7610 running out in April, I wanted to be absolutely sure that its sensitivity was up to spec and not contributing to the signal variability I was seeing. The simplest way to do this was to inject a -73 dBm signal and verify the meter reads S9.

The lowest signal my CCSG² can put out is 1 mV , which is 26 dB over S9, so I needed to add attenuation. I pulled out my homebrew variable attenuator and validated the steps using my digital power meter³. By adding 60 dB of attenuation at the signal generator output an amplitude setting of 50 mV produces an S9 signal of $50\mu\text{V}$. Halving the voltage (-6 dB) drops the signal level one S-unit. Using this setup I found that my IC-718, IC-7300, and IC-7610 meet the IARU spec for S9, but S-units on the meter are spaced by 3 dB, and not 6 dB as specified by the IARU.

This S-meter calibration exercise has validated the sensitivity of my transceivers and showed me how to translate S-meter readings into IARU S-units. It also gives me reference measurements for quick transceiver checkups in the future.

References

1. *S-Meter Calibration*, Carl Luetzelschwab K9LA, September 2017, hamsci.org/s-meter-calibration
2. *S Meter*, Wikipedia, en.wikipedia.org/wiki/S_meter
3. *What Does My S-Meter Tell Me?*, Doug DeMaw, W1FB, QST June 1977
4. *S-Meter Calibration Test Summary*, vu2nsb.com

1 Propagation between stations is by ground wave, which are attenuated by hills.
2 Cheap Chinese Signal Generator
3 Power Meter project: <http://nparc.org/newsletters/Jun16MSG.pdf>