

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)**

June 2025

Volume 58 No. 6

Regular Meetings

**Second & Fourth Mondays
at New Providence Salt Brook School**

June 9 - Field Day Planning

June 23 - Field Day Planning

June 28,29 - Field Day

Upcoming Events

Digital Net Mondays at 9 PM - 28.085 MHz (+/-)
CW Training Net, 9PM Thurs - 28.050 or 7.030 MHz

Check announcements in the Reflector for details.

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 2025

President: K2AL, Al Hanzl
908-872-5021
Vice President: W2EMC Brian DeLuca
973-543-2454
Secretary: K2AL, Al Hanzl
908-872-5021
Treasurer: K2YG, Dave Barr
908-277-4283
Activities: N2TO, Kevin Glynn
917-885-4424

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 MHz
Will be using PSK and RTTY
Net control KC2WUF

CW Training Net
Thursdays 9 PM
28.050 or 7.050 MHz
Net control K2YG

Club Internet Address

Website: www.nparc.org
Webmaster KC2WUF David Bean
Reflector: nparc@mailman.qth.net
Contact K2AL, Al

MOUNTAIN SPARK GAPS

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Contributing Editors:
WB2QOQ Rick Anderson

Climatological Data for New Providence - April 2025

The following information is provided by Rick, WB2QOQ,
who has been recording daily weather events at his station
for the past 44 years.

TEMPERATURE -

Maximum temp. this April, 83 F (April 19)
Last April(2024) maximum was 84 F.
Average Maximum temp this April, 63.2 F

Minimum temp this April, 28 F (April 9)
Last April(2024) minimum was 35 F.
Average Minimum temp this April, 43.9 F

Minimum diurnal temp range, 6 F (45 – 39 F) 4/11
Maximum diurnal temp range, 36 F(73 - 37 F) 4/18

Average temp this April, 53.6 F
Average temp last April, 52.4

PRECIPITATION -

Total precipitation this April– 3.5” rain
Total precipitation last April -4.49” rain

Maximum one day precip. event - April 6, 1.17” rain
Measurable rain fell on 13 days this April
16 days last April.

YTD Precipitation – 11.73” rain

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Rick Anderson
243 Mountain Ave.
New Providence, NJ

5/14/2025

(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 Report

FIELD DAY

It is June and of course the main story is Field Day!

Hard to believe that another Field Day is right around the corner, taking place on Saturday and Sunday June 28-29. NPARC will once again be operating at the "Back Lot" of Governor Livingston High School in Berkeley Heights.

We started planning our FD operations at the May 28 meeting and will continue planning at the June 9 and June 23 meetings.

We will be using the Club's Yaesu FT-710 radios at Field Day for the first time. We used them at Winter Field Day to get used to them. We will bring one to the June planning meetings. I would also advise getting familiar with the operation of the radio by going to the Yaesu.com website and perusing the operating manual.

SUMMER MEETING SCHEDULE

Our last meeting this school year at Salt Brook is on June 9th.

For summer meetings, we have reserved the 3rd Floor Conference Room at the NP Municipal Building, 360 Elkwood Avenue.

We plan to be back at Salt Brook in September.

MEMORIAL DAY PARADE

Thanks to Rick, WB2QOQ we had a great turnout of Club members marching behind our banner in the New Providence Memorial Day Parade and with W2PTP driving one of his beautiful classic cars. And a thank you to Sam, KC2OSR, and his xyl Marilyn for the Memorial Day donuts.

N2J 60th Anniversary Special On-Air Operating Event

Our special event is winding down. It has been a huge success with over 500 contacts so far. We have received many good wishes and compliments from many of those we have contacted.

NEW MEMBERS

We welcome new members Pam, KE2FTA, and Mike, KE2EZM, to NPARC. Pam was awarded her call on her birthday- the perfect gift!

73,
Al K2AL



Popular Contests in June 2025

Dave Barr – K2YG

Contest Name*	Dates (EDT)	Modes	Exchange	Notes & Websites**
VK Shires	6/6 Fri 8 pm to 6/7 Sat 8pm	CW SSB	VK: rs(t) + Shire Non: rs(t) + CQ Zone	No Power Classes. 160-10 m**. See: www.wia.org.au
Atlantic Canada QSO Party*	6/7 Sat 8am-10pm	CW SSB	VE1/9, VO1/2, VY2 rs(t) + prov + county/div Non: rs(t) + State/Prov	QRP/LP/HP 80-10 m**. More info at: acqp.ca
Kentucky QSO Party*	6/7 Sat 9am-9pm	CW SSB RTTY	KY: rs(t) + county Non: rs(t)+state/prov	QRP/LP/HP 80-10 m**. More info at: www.kyqsoparty.org
ARRL Int. Digital	6/7 Sat 2 pm to 6/8 Sun 8 pm	Digital (No RTTY)	4 Character Grid Square	QRP/LP 160-6 m** See rules at: contests.arrl.org
ARRL June VHF	6/14 Sat 2 pm to 6/15 Sun 11 pm	All Modes	4 Character Grid Square	50 Mhz & Up. Rules & Categories at: www.arrl.org
All Asian DX Contest CW	6/20 Fri 8 pm to 6/22 Sun 8 pm	CW	RST + Age	LP/HP 160-10 meters**. More info at: www.jarl.org
S Perry 160m Challenge	6/21 Sat 11 am to 6/22 Sun 11 am	CW	4 Character Grid Square	QRP/LP/HP 160 m only. More info at: www.kkn.net
West Virginia QSO Party*	6/21 Sat 12 N to 12 Mid	Phone CW/Digital	WV: rs(t)+County Non: rs(t)+st/prov	QRP(5/10w)/LP/HP 80-10 m**. More info at: www.qsl.net
ARRL Kids Day	6/21 Sat 2 pm to 8 pm	SSB	Name + Age + QTH + Favorite Color	80-10m**+repeaters w/permission. Info at: www.arrl.org
Feld Hell Sprint	6/21 Sat 8pm to 6/22 Sun 8 pm	FeldHell Use FLdigi Prog	Name, FH# (members); QTH; Grid (others)	No power restrictions. For FH# and rules: sites.google.com
ARRL Field Day	6/28 Sat 2 pm to 6/29 Sun 2 or 5pm	All Modes	#Xmtrs/Class(A-F)/ ARRL-RAC Section	QRP/LP/500 All Bands**. Read rules at: www.arrl.org

Check www.contestcalendar.com or contest specific websites for more information on these and many other radio contests.

* State QSO Parties allow out-of-state stations to contact only in-state stations for that specific contest. In-state stations may contact all contest stations. See websites for county abbreviation lists.

** No WARC bands in any contest.

There are many more contests every month including weekly and monthly repeating contests with a variety of abilities required, such as slow speed cw contests. For info on more contests, please check www.contestcalendar.com.

NPARC Takes Part In New Providence Parade

Rick Anderson – WB2QOQ

The club continued its streak of taking part in the town Memorial Day, Monday, May 26, in our club's 60th year; and the weather was just fantastic.



A couple members dropped out of the parade participation, prior to the gathering, so we wound up with a total of 12 taking part; 8 walkers and 4, including Paul, in his classic car. This year, as last, we had the addition of a 1956 Chrysler 2-door hardtop, in our parade unit; owned by Paul Wolfmeyer, W2PTP. As in past years, our members gathered in the library parking lot, prior to motoring to the designated starting place on Central Ave. The bulk of members rode to Central Ave., in Rick's Toyota pickup truck. On Central Ave. we assembled the new Club banner and took our position amongst the other groups taking part.



The parade route, as always, followed Springfield Ave., from Central, through the center of town, to Academy St. We were greeted along the parade route, by the many residents enjoying the parade along the way. Friends took photos of our group, along the route, as did Don, K2DAM. Some members visited the N.P. American Legion Post 433, after the parade; where hot dogs, salads, and drinks were provided. We had our own club table, and conducted club conversation; of course! It was another successful club event, which has been taking place for Over 29 years. We'll have to open the Archives and search for when the club began taking part in this parade!

Thanks to the following members who took part in the parade: David Bean, KC2WUF; Pam Conley, KE2FTA; Brian DeLuca, W2EMC; Tim Farrell , KD2EKN; Al Hanzl, K2AL; Frank McAneny, K2EZR; Don Madson, K2DAM; Eric Russell, KD2ONY, Sam Sealy, KC2OSR; Hank Steckler, K2OT; Paul Wolfmeyer, W2PTP; and Rick Anderson, WB2QOQ.

Hope to see you next year!

73,

Rick WB2QOQ

SWR of Billiard Balls

Jim Stekas – K2UI

SWR is an acronym for Standing Wave Ratio, a terminology we all use but few of us understand. An example of standing waves is the motion of a plucked guitar string. Longitudinal waves along the length of the string will bounce back and forth between the fixed ends. The combination of longitudinal waves produce standing waves that vibrate up and down with a sinusoidal shape but do not move along the string.

Back “in the day” hams determined SWR by measuring the amplitude of standing waves along a balanced transmission line using a neon bulb. The transition to coax after WW2 rendered the neon bulb useless and were replaced by bridge circuits. In the April, 1947, QST, Mack C. Jones (W1PNX) published a description of the Micromatch SWR meter.

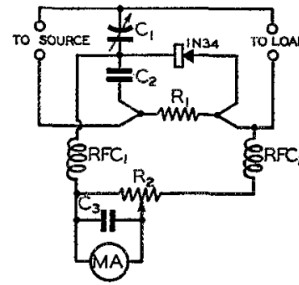


Fig. 5 — Circuit diagram of the Micromatch standing-wave indicator.

The Micromatch measures the amplitude of forward and reverse RF waves and uses a calibrated meter to read reverse amplitude in units of SWR. What is actually being measured is the magnitude of the reflection coefficient, $|\Gamma| = \sqrt{\frac{P_{rev}}{P_{fwd}}}$, where P_{fwd} and P_{rev} are forward and reverse power.

SWR and Γ are related by the equations $SWR = \frac{1+|\Gamma|}{1-|\Gamma|}$ and $|\Gamma| = \frac{SWR-1}{SWR+1}$.

If we standardize our system interfaces to R_0 (e.g. $50\ \Omega$) a load of impedance Z will result in a reflection coefficient¹ of $\Gamma = \frac{Z-R_0}{Z+R_0}$. The parameter Γ is so fundamental to RF engineering that the Smith chart was designed to plot it.

So how does SWR tie into billiard balls? First we express power in terms of current: $P = R_0 I \cdot I^*$

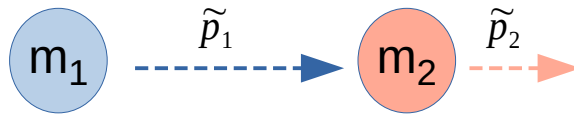
and convert $|\Gamma| = \sqrt{\frac{P_{rev}}{P_{fwd}}}$ into $\Gamma = \frac{I_{rev}}{I_{fwd}}$. Next we recognize that a charge q moving with velocity v creates a current (pulse) $I = q \cdot v$. Similarly, a billiard ball of mass m and velocity v has a momentum $p = m \cdot v$, which looks a lot like a “mass current pulse”.

Consider a billiard ball of mass m_1 is shot with momentum p_1 directly into a second billiard ball of mass m_2 at rest on the table.



¹ A proof of this equation is given in the appendix. Plug in $Z=100$ and $Z=25$ and verify that both give $SWR=2$.

As a result of the collision, the two balls will recoil with final momenta² $\tilde{p}_1 = -p_{rev}$ and \tilde{p}_2 .



Conservation of momentum and energy require $p_1 = \tilde{p}_1 + \tilde{p}_2$ and $\frac{p_1^2}{2m_1} = \frac{\tilde{p}_1^2}{2m_1} + \frac{\tilde{p}_2^2}{2m_2}$.

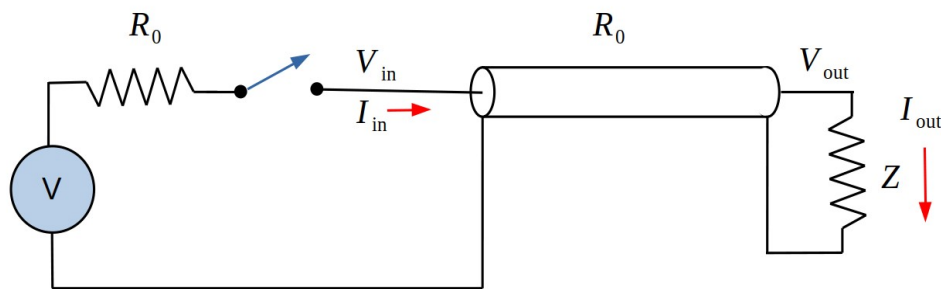
Solving for final momenta gives $p_{rev} = -\tilde{p}_1 = \Gamma \cdot p_1$ and $\tilde{p}_2 = (1+\Gamma) \cdot p_1$, where

$$\Gamma = \left(\frac{m_2 - m_1}{m_2 + m_1} \right) \text{ which looks very much like } \Gamma = \left(\frac{Z - R_0}{Z + R_0} \right) .$$

- When $m_2 > m_1$, $SWR = \frac{m_2}{m_1}$, $\Gamma > 0$ and m_1 bounces backward off m_2 .
- When $m_2 < m_1$, $SWR = \frac{m_1}{m_2}$, $\Gamma < 0$ and m_1 slows and continues to the right.
- When $m_2 = m_1$, $SWR = 1$, $\Gamma = 0$ and therefore m_1 stops dead when it hits m_2 .

Appendix

Our transmitters are designed with an output impedance of $R_0 = 50\Omega$. The figure below shows a schematic of a CW transmitter feeding a load of impedance Z through a coax with a characteristic impedance of R_0 .



Switch Closure

When the switch is closed at $t=0$, an RF wave will flow into the coax and see the coax inrush impedance of R_0 . Until the signal reaches the load there will no reflected wave in the coax, only a forward wave with current $I_{fwd} = I_{in} = \frac{V}{2R_0}$.

² In analogy to I_{rev} , the positive direction for p_{rev} is to the left, equal and opposite to \tilde{p}_1 .

Steady State

At some point the coax will contain both forward and reflected waves and the output current at the load will be $I_{\text{out}} = \frac{V}{Z + R_0}$. Current conservation requires a reverse current of $I_{\text{rev}} = I_{\text{fwd}} - I_{\text{out}}$.

Reflection Coefficient

The reflection coefficient is defined as: $\Gamma = \frac{I_{\text{rev}}}{I_{\text{fwd}}}$. Substituting expressions for I_{rev} and I_{fwd}

we end up with $\Gamma = \frac{Z - R_0}{Z + R_0}$.

We included a coax feed in the schematic model used to derive this result, but nowhere did the length of coax enter the calculation. Therefore the expression for Γ holds even when there is no coax at all (coax length equals zero).