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. 12 December 2021

Regular Meetings

Second & Fourth Mondays
1/10/22 Salt Brook School Cafeteria
(Same location as last auction)
1/24/22 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

ZOOM until further notice

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

MOUNTAIN SPARK GAPS

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The Watchung Mountain Area Radio Club
P.O. Box 813
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Editor: K2EZR Frank McAneny
Contributing Editors:
WB2QOQ Rick Anderson
W2PTP Paul Wolfmeyer
K2UI Jim Stekas

Climatological Data for New Providence for November 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 November, 63 deg. F (November 9, 12)
Last November(2020) maximum was 71 deg. F.
Average Maximum temperature this November, 50.2 deg. F
Minimum temperature this November, 45 deg. F (November 1, 18)
Last November(2020) minimum was 24 deg. F.
Average Minimum temperature this November, 35.1 deg. F
Minimum diurnal temperature range, 6 deg. (38 - 32 deg.)11/28
Maximum diurnal temperature range, 24 deg. (61 - 37 deg.)11/13

Average temperature this November, 42.7 deg. F
Average temperature last November, 48.3 deg. F

PRECIPITATION -
Total precipitation this November- 1.02" rain/snow melt; 0.1" snow
Total precipitation last November- 4.45" rain.

Maximum one day precip. event this November- November 12, 0.50" rain.
Measurable rain fell on 9 days this November,10 days last November.
Measurable snow fell on 1 day this November.

YTD Precipitation - 53.99"

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Rick Anderson
12/20/2021
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 December 2021

Lots to cover this month—from the banquet to awards to possible in-person meetings and an auction to the year-in-review.

It was great to gather together December 4 for our holiday luncheon—we had thirty in attendance. Thanks to James Kern KB2FCV and Dave Barr K2YG for arranging and managing the luncheon.
Awards were presented:

Heather Speas KD2VZA was named **Rookie of the Year**. She first "arrived" at the club in February as a potential ham and progressed rapidly to General. She is on the air, running a traffic net, working DX, and bringing in new members and hams.

Rick Anderson WB2QOQ is **Ham of the Year**. Rick has been a longtime, regular, faithful provider of data for Spark Gaps. He has organized our club response to the New Providence parade (sadly cancelled the last two years due to the pandemic) and has brought the tower and antennas for VHF for Field Days. (Now it may seem strange to recognize a Ham of the Year for activities that couldn't be held the past two years, but it is high time we recognize Rick's many contributions to NPARC!!)

Bill Hudzik W2UDT received the **Wouff Hong** for his many years of contributions to the club and the ARRL. It is properly displayed prominently in his shack!

Congratulations to the award winners!

In-person activities: Al K2AL has arranged for the use of Salt Brook School cafeteria for the first monthly meeting of the club January through June and for an Auction date of February 26. This was completed before recent increases in Covid. **So watch the reflector for the specific plan for January 10.** The January 24th meeting will be a ZOOM event.
So let's look back at the year 2021. We had 23 ZOOM meetings with many excellent programs: Ria N2RJ on drones, Andrea K2EZ on roving, Alex W7HU on his station, Dave K2YG on getting into contesting, Gordon West WB6NOA on emergency communications, Tim Duffy K3LR on contesting and his contest station, Pete W2IRT on the W2 QSL bureau, Julia on QSL design, Al K2AL on station grounding, and Jim K2UI on nanoVNA use. Thanks Sam for your diligence in securing these.
From a club business perspective, we did some important "cleanup". We augmented our bylaws to include hybrid meetings as an option; we improved membership bylaws to be sure they are "inclusive"; we added a dissolution bylaw. The Executive Committee implemented a budgeting approach for fiscal year 2022 and presented it to the club.
It was a great pleasure to elect Guy Brennert K2EFB and Barry Cohen K2JV to Honorary Life Member status in NPARC.
We were unable to have an auction or have a collective in-person Field Day due to the pandemic. But we did have 13 members participate in Field Day, aggregating almost 14000 points!!
I would like to thank my fellow officers for their good work this year. Bob K2GLS, Al K2AL, Dave K2YG, and Sam KC2OSR. We got through some banking, 501c3, and bylaw issues—not the most exciting stuff—but necessary. I recognized Bob in my November column, my thanks again! We welcome Brian W2EMC as our new Vice President.
Thanks to Frank K2EZR for getting Spark Gaps together and out each month. And, thanks to David KC2WUF for keeping the website up and working.
Well, I probably missed some things in "wrapping up" the year. We have tried to stay-the-course and adapt to the virus situation as best we could. I'd say we did okay. Use the continuing environment to operate—that we can do while social-distancing. Best wishes for 2022,

73
Wolf W2PTP 201-404-6914 w2ptp@arrl.net

STATE QSO PARTY QRP PORTABLE

The State QSO Party Challenge was started to encourage participation in state QSO parties which occur from February through October. There were 45 sanctioned QSO parties in 2021. The challenge is to work them all ("Worked All QSO Parties" award) and earn points based on the number of total QSO's and the number of state QSO parties in which you participated. I had participated in all the parties to date, so I decided to try operating the last two parties of the year (New York and Illinois) while on vacation in Cape May. There is a rule that you must make at least two QSO's to get credit for that contest, so I only needed to operate briefly on Saturday and Sunday to continue the streak.

I purchased an MFJ End Fed Half Wave antenna, 66 feet long, covering 40-10 meters, and tried it out in the backyard earlier this year. I decided to go QRP with the EFHW with my Icom-705, Elecraft T1 antenna tuner and a Bulldog key for CW.

Fortunately, there was a nice Kiwanis Park with a covered gazebo only two blocks down from our motel in Cape May.

I threw a softball attached to nylon cord over a tree branch and from there ran the antenna down to the gazebo and attached a 20 foot wire counterpoise.

Running 5 watts, I was able to make about 20 contacts easily, both CW and Phone, in both contests on 40 and 20 meters in about an hour of operating each day. I also worked W2EMC/2 in the NYQP on 40 phone!

Overall, lots of fun and a nice way to wrap up the 2021 State QSO Party Challenge.

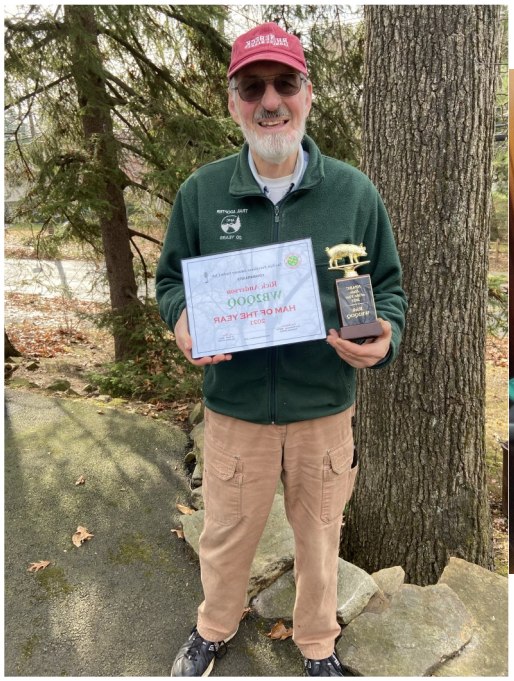
Al
K2AL
October 2021

SETUP

Antenna

Many Thanks for the NPARC Ham of the Year Award, for 2021 !
Though I feel a bit embarrassed to accept this award, based on my level of Activity with on the air Amateur Radio operating; ; over this past year. It seems my level of activity with N.P. Historical Society events has been taking up a larger part of my free time. When Al, K2AL, delivered the award to me, I mentioned this lack of club activity. But he stated the award included the various club activities which I have dedicated time toward, and been involved with; over my many years as a member of NPARC.
When I began thinking about what activities I had taken part in, over these 41 years with the club; it brought back memories of yesteryear in NPARC:
Officially joining the club in 1986.
In 1987, held the office of President.
In 1989 was the recipient of the NPARC Woulf Hong Award.
Have organized the club participation in the N.P. Memorial Day Parade, each year, since 1987.
Have actively participated in every NPARC Field Day, since joining the club, as a Co-VHF Station Manager.
Taken part in numerous Kids Day events, at various locations, with installation of VHF antenna and club banner.
Taken an active part in numerous club Auctions, over the years, at various locations.
Submitted monthly local weather summaries, in club Spark Gaps newsletters; for many years.

So, in the past 35 years or so, I can reflect on taking part in some fun and interesting club events; and working hand-in-hand with a number of interesting members.
Thanks again for this award in 2021.
73
Rick, WB2QOQ

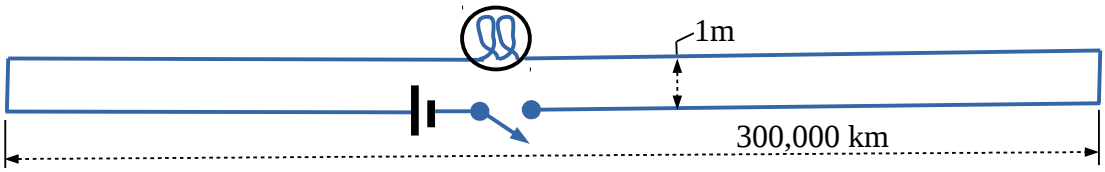


Heather, KD2VZA, Accepting Rookie of the Year award from W2PTP.

Do Wires Carry Energy?

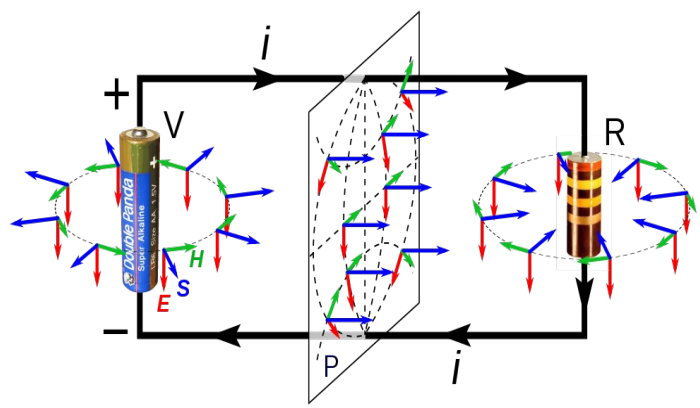
Jim Stekas - K2UI

While browsing around YouTube I stumbled upon a video by Vitasium[1] called "The Big Misconception About Electricity". The video presents the circuit below and asks "How long will it take for the bulb to light after the switch is thrown?"



A full trip around the circuit at the speed of light would take 2 seconds. Assuming that current travels at the speed of light, it is reasonable to estimate that the bulb will come on 2 seconds after the switch is thrown. One might also argue that when the switch is thrown the battery starts pumping out electrons from the negative terminal and sucking them into the positive terminal. In 1 second the current loop would be complete and the bulb would light. Both of these answers seem very reasonable, but they are both very far off. In fact, once the switch is thrown it will only take about 3 nano seconds for energy to reach the bulb!

The author of the video uses the argument that according to Maxwell's equations energy flow is given by Poynting's vector, $\vec{S} = \vec{E} \, x \, \vec{B}$. In a circuit the $\vec{E}$ field points perpendicular to the the wires and the $\vec{B}$ field encircles them. The figure at right shows a simple circuit with a battery and resistor in series. Note how $\vec{S}$ points outward from the battery , through space, and into the resistor. Assuming the wires are perfect conductors, $\vec{E} = 0$ inside the wires, and therefore $\vec{S} = 0$ as well. Thus, no energy is transported by the wires!

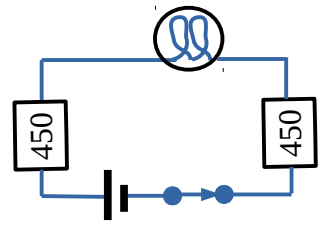


Vitasium's argument is that when the switch closes the fields around the battery will increase and propagate to the bulb, 1m away, at the speed of light. This is a pedantic argument that supports the 3 nano second answer, but offers no insight into what happens in the circuit. Clearly, circuit theory must also obey Maxwell's laws.

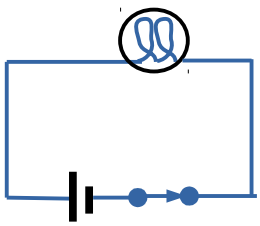
A more intuitive way to analyze Vitasium's circuit is to use standard transmission line theory. The characteristic impedance of a transmission line, R_0 , is also called the "surge impedance". If a voltage, V , is applied to a transmission line there will be an instantaneous surge current $I_S = V/R_0$ that is independent of how the line is terminated. If the length of the line is L, the initial transient excitation will be reflected back to the source in $T = 2L/c$ seconds at at which point the terminating resistance (zero in this case) will be seen at the input.

1 "The Big Misconception About Electricity", https://youtu.be/bHIhgxav9LY

Assuming the 150,000 km loops are made of $450\,\Omega$ ladder line, when the switch is thrown the large circuit will look like the equivalent circuit at right while $t_0 < t < 2s$ and the turn-on transient has not reflected back from the ends of the ladder line. Note that if the bulb resistance $R_B \ll 900\,\Omega$ it might not get enough current to light at all!

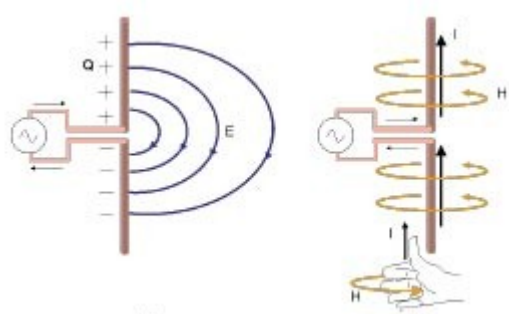


Here t_0 is the time it takes for a surge current on one side of a transmission line to induce the opposite current on the other wire. Typically, we assume $t_0 = 0$ in practical applications, but this is not one of those. Clearly $t_0 \approx d/c$, the time for light to propagate across the wire spacing, d, which is Vitasium's estimate. The key point is that t_0 depends on the wire spacing and not the length of the transmission line.



At $t = 2s$ the transient from turn-on will have had time to reflect from the end of the transmission line(s) and return to the input. For $t > 2s$, the circuit is in a steady state and the terminating short will be seen at the input as shown in the equivalent circuit at left.

Poynting's vector can be a powerful tool for visualizing a problem and intuiting a solution. But it can also take you down a rabbit hole, particularly in the neighborhood of wires. For example, in a perfect conductor, $\vec{E}$ must point outward from the wire surface while $\vec{B}$ circulates around the wire (see figure at right). Since $\vec{S}$ is perpendicular to both $\vec{E}$ and $\vec{B}$ it must point along the wire at its surface, implying that a dipole should radiate maximum energy toward end-fire with a null at broadside. ***Wrong!***



In the far field, $\vec{E}$ field lines leaving the dipole at right angles to the wire eventually close in a loop with $\vec{E}$ parallel to the wire at broadside. This gives an $\vec{S}$ in the far field a component toward broadside, as expected.

Close to the dipole, the only place where $\vec{E}$ is parallel to the wire is across the feed point, and that is the only place on the dipole's surface where $\vec{S}$ points broadside. Therefore it would appear that all the radiation from a dipole originates from the feed point.[2] So what do we need the wires for? According to Serge Schelkunoff the wires match the feed point impedance in the near field to the impedance of free space in the far field. Sorry, let's back out of this rabbit hole ...

Perhaps it is true that electrical energy is transported by $\vec{S}$ and not by wires. Nevertheless, circuit problems can invariably be solved most easily by ignoring $\vec{S}$ and assuming that wires ***do*** transport energy. Whether energy is transported in the dielectric of a coax or in the conductors doesn't matter so long as transmission line theory applies.

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2 "Radiation in the Near Zone of a Hertzian Dipole", https://physics.princeton.edu//~mcdonald/examples/EM/jackson_ajp_74_280_06.pdf