MOUNTAIN SPARK GAPS

NPARC—The Radio Club for the Watchung Mountain Area

Website: http://www.nparc.org
Club Calls: N2XJ, W2FMI

VOLUME 50 NO.4 April 2015

UPCOMING EVENTS

Regular Meetings

4/13 & 4/27
Monday 7:30
NP Community Center

Memorial Day Parade
Monday 5/25

Meeting Schedule

Regular Meeting: 7:30—9:00 PM
2nd Monday of each month at the
NP Senior & Adult Center
15 East Forth Street
New Providence

Informal Project Meeting: 7:30—9:00 PM
4th Monday of each month
Same location
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 2015

President: KC2WUF David Bean
973-747-6116
Vice President:K2UI Jim Stekas
973-377-4180
Secretary: KD2EKN Tim Farrell
908-244-6202
Treasurer: K2YG Dave Barr
908-277-4283
Activities: W2PTP Paul Wolfmeyer
201-404-6914

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
First & Third Mondays 9 PM
Details as announced.

Club Internet Address

Website:http://www.nparc.org
Webmaster K2MUN David Berkley
Reflector: nparc@mailman.qth.net
Contact K2UI, Jim

MOUNTAIN SPARK GAPS

Published Monthly by NPARC, Inc.
The Watchung Mountain Area Radio Club
P.O. Box 813
New Providence, NJ 07974

Editor: K2EZR Frank McAneny
Contributing Editors:
WB2QOQ Rick Anderson
WB2EDO Jim Brown

Climatological Data for New Providence for March 2015

The following information is provided by Rick, WB2QOQ, who has been recording daily weather events at his station for the past 34 years.

TEMPERATURE -

Maximum temperature this March, 59 deg. F (March 26)
Last March(2014) maximum was 64 deg. F.
Average Maximum temperature this March, 45.6 deg. F
Minimum temperature for this March, 5 deg. F (March 6)
Last March(2014) minimum was 7 deg. F.
Average Minimum temperature this March, 25.5 deg. F
Minimum diurnal temperature range, 8 deg. (43-35 deg.) 3/15
Maximum diurnal temperature range, 33 deg. (41-8 deg.) 3/7
Average temperature this March, 35.6 deg. F
Average temperature last March, 36.0 deg. F
Number of days this March with daily minimum temperatures of
20 deg. or lower - 6; last March - 9.
2 days this March saw temperatures in the single digits; last Mar., 2 days.

PRECIPITATION -

Total precipitation this March - 15.1" snow; 0.13" rain/melted snow.
Total precipitation last March - Trace snow; 3.6" rain.

Maximum one day precip. event this March; March 5, 6.5" snow.
Measurable rain fell on 8 days this March, 7 days last March.
Measurable snow/sleet fell on 5 days this March.

==========

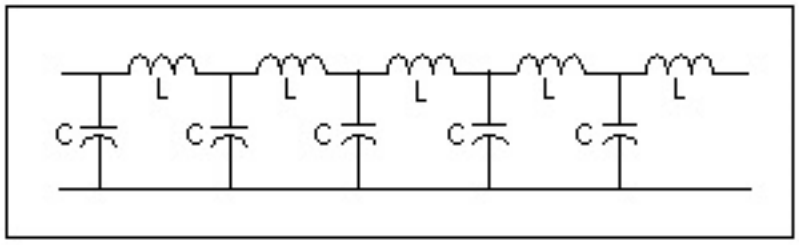
Rick Anderson
4/15/15
243 Mountain Ave.
New Providence, NJ
(908)464-8912
rick243@comcast.net

Lat = 40 degrees, 41.7 minutes North
Long = 74 degrees, 23.4 minutes West
Elevation: 380 ft.
CoCoRaHS Network Station #NJ-UN-10
New Providence, NJ

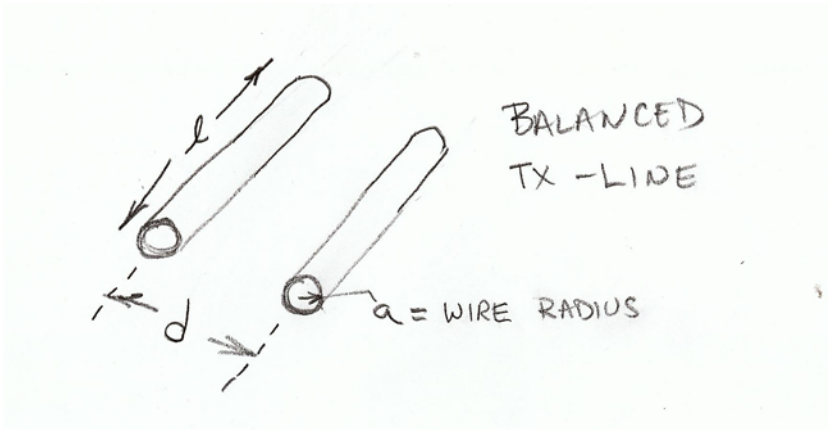
Transmission Line Theory at DC

Jim Stekas - K2UI

Transmission lines are used to carry RF energy between our rigs and antennas. The standard circuit model of a transmission line breaks it up into many small sections composed of a parallel capacitor and series inductor.



When the line is terminated with the characteristic impedance Z_o then Z_o is seen at the input. It is easy to determine Z_o by requiring $Z_o = (Z_o + L) \| C$. The solution is $Z_o = \text{sqrt}(L/C)$.



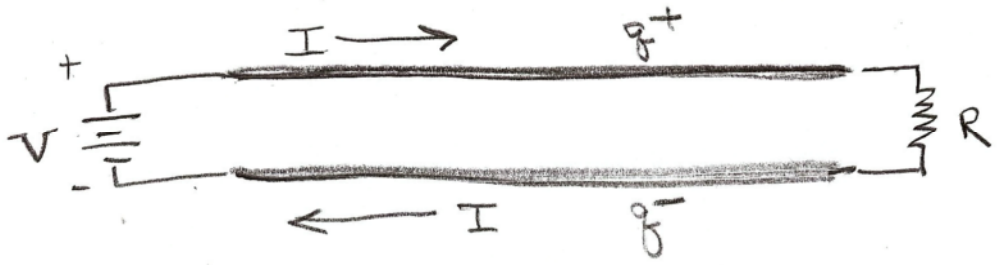
For the balanced transmission line above we can calculate L, C and Z_o for very low frequencies where the length of the line is very much less than a wavelength.

$$L = \frac{\mu l}{\pi} \ln(d/a) \qquad \text{INDUCTANCE}$$

$$C = \frac{\varepsilon \pi l}{\ln(d/a)} \qquad \text{CAPACITANCE}$$

$$Z_o = \sqrt{\frac{L}{C}} = \sqrt{\frac{\mu}{\varepsilon}} \frac{\ln(d/a)}{\pi} \qquad \text{IMPEDANCE}$$

At DC, all the capacitors look like open circuits and the inductors short circuits, so for ***any*** terminating resistor R, we will see R at the input. But surprisingly, $R = Z_o$ is a magical condition even at DC!



If we "drive" the line with a battery of voltage V and terminate it with resistance R we will get a current of I = V / R. The current flows in opposite direction in each wire resulting in a repulsive force due to their magnetic interaction. At the same time, the capacitance of the line results in the build up of a charge q = CV. The opposite charge on each wire have an electrostatic attraction.

$$F_B = \frac{\mu l}{2\pi d} I^2 \qquad \text{FORCE BTWN CURRENTS}$$

$$F_E = \frac{-1}{2\pi d l \epsilon} q^2 \qquad \text{FORCE BTWN CHARGES}$$

These magnetic and electrostatic forces are given by the equations above. Now, lets determine what resistance R results in cancellation of the two forces. Substituting for I and q and cancelling common factors ….

$$\mu l \frac{V^2}{R^2} - \frac{V^2 C^2}{l \epsilon} = 0$$

$$\Rightarrow R = \sqrt{\frac{\mu}{\epsilon}} \frac{\ln(d/a)}{\pi} = Z_o \; !!$$

New Providence Memorial Day Parade

NPARC members are invited to participate in this years Memorial Day Parade, taking place on Monday, May 25. Our club has annually participated in this town event, for as long as I can recall; and a decent attendance in this club activity is requested. This is the one public event where hundreds of town's people get to see the club members, and a good attendance is most welcomed. Last year there was a decent participation in our parade unit. As in past years, we request members to initially meet in the New Providence Memorial Library parking lot at 9:25 a.m., and we will truck pool over to our starting position on Central Avenue.

Suggested dress code is white shirt, blue slacks, NPARC yellow cap, and of course your 2 meter HT, tuned to club frequency.

As in prior years youth club members are more than welcome to join us, whether they're licensed or not. There will be handie talkies available for youth.

Our unit will walk the parade route, down Springfield Ave., between Central Ave. and Academy St. Please consider taking part in this community event.

Please contact Rick, WB2QOQ, if you will be participating in the parade or have questions. rick243@comcast.net; (908) 464-8911.

Past year Marchers

Contesting as K2AL/1

My brother Ken has a home in central Vermont and since I was getting active in HF again, I decided that it might be interesting to operate a contest from his location. His elevation is approximately 2000 feet and is away from RF noise.

I decided to work SSB as that is a better mode when demonstrating ham radio to relatives and friends.

The North American QSO Party Phone is a good one as it is only 12 hours long beginning Saturday afternoon EST and the exchange is your state and name. It is a competitive but friendly contest and with states as the multiplier it is fun for the non-hams to track the number of states worked. It takes place twice a year in January and August.

My daughter Lauryn, W2OLF, and I headed up to Vermont last August but I did not put in a major effort for the contest not quite knowing what to expect. I having to work Saturdays, we left New Jersey in the late afternoon after work.

After arriving in Vermont, Ken, Lauryn and I had something to eat and we then set up a multi band trapped dipole up around 40 feet by throwing a softball into the trees to set the lines in order to get on the air for the last few hours of the contest.

I called CQ starting around 10 PM and a pile up ensued. I suppose Vermont was a relatively rare multiplier! I did not stop operating until the contest ended at 2 AM. Lauryn logged while I operated and we hardly had time to drink our wine or coffee during the run. Obviously, we had a blast and we decided to come back again in January for the contest. (Any excuse to visit Vermont…..!)

I decided to work the whole contest in January and purchased a new multi band trap dipole for 80-10 meters. It did not work out as planned with that antenna but I brought along some backup antennas including the "K2JV Ladder Line Dipole" and a 20 meter dipole. So despite the 1 degree temperature, we managed to switch out antennas several times. We made about 300 QSO'S and of course had a great time and it made for a good demo as the whole Hanzl clan came up to see the action.

In an effort to improve the contest score for the August contest, I am planning on bringing up a 102 foot doublet fed with ladder line and the MFJ-969 tuner I recently purchased from N2AUG. Ken hired the local Vermont handyman to install pulleys in his higher trees in preparation for the contest.

Another nice result was in my brother Ken getting his ham license. I guess the demo finally sparked an interest. He recently passed his Tech and General exams and applied and received the callsign W2IOC, which was our dad's call. So it will definitely be a multi-op setup next time!

Attached are some photos of our "Vermont DXpedition".

Al

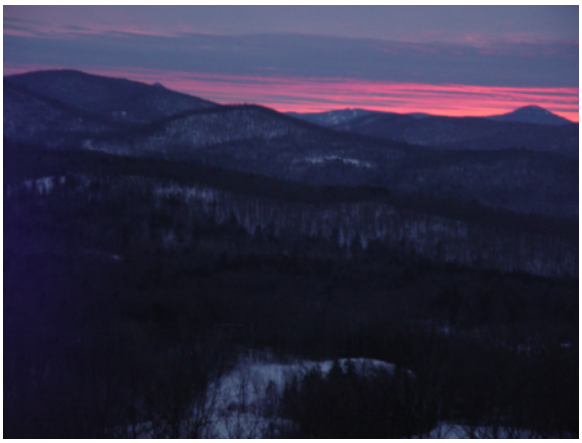
K2AL

!

Ken (W2IOC), Lauryn (W2OLF) and Al (K2AL)

K2AL and W2OLF operating in the contest

View of antenna



Sunset view from the deck

K2AL and W2IOC soldering the PL259 connector to the RG8X.

I can see why he likes it!

SCIENTIFIC TIDBITS

Pluto's Long-awaited Close-up

After a journey of almost nine years and nearly 3 billion miles, NASA's New Horizons spacecraft is about to provide the first-ever close-up view of Pluto and its estimated five moons. Launched in January 2006, the probe has spent almost two-thirds of its journey in a series of 18 hibernation periods; this last December it awoke from its final slumber. Pluto, which lost its full-fledged planetary status in 2006, is so small (about one fifth the size of Earth) and so far away that even images taken from the Hubble telescope show little more than a blurry splotch. New Horizons will start sending detailed images in May; its closest flyby will be in July, when the probe will come within a few thousand miles of the "dwarf planet," which is just one of hundreds of thousands of icy racks circling the sun in what is known as the Kuiper Belt, at the edge of the solar system. The images will allow scientists to analyze the surface and atmospheric compositions of Pluto for the first time. They do not expect to find any forms of life there, but now know that Pluto is really a gateway to an entire region of new worlds. As we plod slowly forward in the exploration of space new and exciting new worlds are beginning to reveal themselves to us and make us realize how truly insignificant our existence here on Earth really is compared to the total cosmos.

A Cure for Alzheimer's?

A new study suggests that Alzheimer's disease could be prevented, and perhaps even
cured by boosting the brain's immune system. In a study involving mice, Stanford University scientists have succeeded in reversing Alzheimer's like symptoms with a drug that boosts microglia, cells that patrol the brain, clearing it of bacteria, viruses and other harmful deposits. When microglia age, a protein called EP2 stops them from operating as efficiently as they did, resulting in the damaged nerve cells associated with Alzheimer's. Researchers found that by blocking EP2's activity, they can enable the microglia to function normally again. When they genetically engineered mice not to produce any EP2, the rodents didn't develop any signs of Alzheimer's; similarly, when researchers blocked the protein in mice that already had the neurodegenerative disease, it reversed their memory decline and confusion. The team is now hoping to create a compound that blocks EP2 without producing any adverse side effects. What a tremendous step forward this would be, if the positive effect on mice can be transported to humans.

Jim WB2EDO