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 51 NO.7 July 2016

UPCOMING EVENTS

Regular Meeting

8/22
Monday 7:30
NP Community Center
No meeting on 8/8
Center closed

K2JV Picnic
See attached flyer

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
973-921-1175
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

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WB2QOQ Rick Anderson
WB2EDO Jim Brown
K2UI Jim Stekas

Climatological Data for New Providence for June 2016

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 June, 91 deg. F (June 19)
Last June(2015) maximum was 91 deg. F.
Average Maximum temperature this June, 82.0 deg. F
Minimum temperature this June, 50 deg. F (June 9)
Last June(2015) minimum was 48 deg. F.
Average Minimum temperature this June, 59.8 deg. F
Minimum diurnal temperature range, 8 deg.(70 -62 deg.) 6/3
Maximum diurnal temperature range, 33 deg. (85-52 deg.) 6/11;(86-53 deg.) 6/18

Average temperature this June, 70.9 deg. F
Average temperature last June, 70.0 deg. F

PRECIPITATION -
Total precipitation this June - 2.80" rain.
Total precipitation last June - 5.95" rain.

Maximum one day precip. event this June - June 28, 1.30" rain
Measurable rain fell on 7 days this June, 15 days last June.

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Rick Anderson
7/9/16
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

Backyard Picnic
Saturday August 13, 2016

Under the Cage antenna,
in the backyard of Norma and Barry K2JV

at 39 Cromwell Court
Berkeley Heights
908-464-1730

Starting at 3:00 PM and ending
When the beer runs out!

All NPARC Members, spouses, kids and significant others are urged to attend.

Help will be appreciated in setting up, cooking, supplying salads and side dishes, and cleaning up after the event.

Please call us ASAP and let us know about how many people are coming with you, so we can supply enough food and drinks for all comers.

Ameco AC-1
Bygone Novice Relic

Jim Stekas - K2UI

After letting my license lapse during my college and grad school years my interest in ham radio was rekindled by packet radio in the early 1980's. I took the VEC exam and was relicensed as NJ2F, bought a TNC-1 kit from TAPR and a 2m rig and was QRV on packet. For HF I picked up a Heathkit SB-101 transceiver at a local hamfest, threw up dipole, and was back on 40m CW. The SB-101 got supplemented with an SB-301 receiver to allow split frequency operation with dual receive.

The Heath gear work very well for 10+ years, but had become long in the tooth and largely supplanted by an IC-720A I picked up at the Split Rock hamfest. My love affair with tubes had cooled off as well, and the SB-101/301 got sold off at a mid-90's NPARC hamfest for $200. I bet they're still working in a hamshack somewhere.

A few year later, while surfing the web I was surprised to learn that the most valuable gear in my shack was my first novice transmitter, an Ameco AC-1. In the 50 years since its introduction as a $20 kit it had developed a cult following and originals in decent condition (or worse) were going for $300+. If you are lucky enough to have an original unbuilt AC-1 kit the sky is the limit …

The AC-1 is a two tube CW transmitter for 40/80m rated at 15 watts input with output around 5-7 watts. In the 1960's it was the cheapest rig for a Novice class ham to get on the air. I would bet most new hams acquired their AC-1 for free as I had. After upgrading, a new General class ham had not further use for an AC-1 and most were cannibalized for parts, given away, or stored away and forgotten about.

The AC-1 used a 6V6 (front tube) as a keyed crystal oscillator. An octal socket (left front) doubled as a crystal socket and telegraph key socket. The 6X5 rectifier (rear tube) in my AC-1 was replaced with silicon rectifiers soldered into the base. Bandswitching was accomplished by swapping coils. My rig came with the 40m coil would on the original clear coil form. An extra coil form cost $1, so I wound my own 80m coil on a plastic pill vial (a la Lew McCoy, W1ICP) mounted on the base of a sacrificed vacuum tube. Dymo labels were used to make it easy to distinguish between the 40m and 80m coils!

The antenna connection was made using screw terminals (located behind the coil) but most AC-1s had an SO-239 connector added for the antenna. My AC-1 also has a ¼ in phone socket added for the the key. (See bottom view.)

The AC-1 has no plate current meter, so tuning it up was a bit of a trick. Ameco recommended adding small neon bulbs to the transmission line and tuning for maximum brightness. That technique was obsolete post 1935, and doesn't work for a coax feed line. My approach was to build a field strength meter and tuning for maximum output. I added little pickup loops at the top of the plug in coils to provide better coupling to the field strength meter.

There was no provision for muting the receiver or driving an antenna relay (which would cost more than the AC-1), so most AC-1 setups used a manual antenna switching arrangement, usually a knife switch. In my case, a separate receive antenna was used. I wired up a 48 phone relay to my bug to provide receiver muting and transmitter keying for full breakin CW. (A discarded Bell System 48v dry cell battery had plenty of juice left to power the relay.) An Ameco code practice oscillator provided sidetone.

Back “in the day”, the 40m novice allocation was from 7150-7200kcps (now kHz.) Every afternoon after school the band was full of teenage novices “texting” each other. Novices were only allowed 75 watts, so going “QRP” with the AC-1 gave up only one S-unit. It had more than enough power to cover much of the 1, 2, and 3 call regions during daylight.

At dusk, the AC-1 could reach out to 4, 8, and 9 land. But as night improved propagation conditions it also brought in the signals of international SW broadcasters from other ITU regions who shared the band. Even with 75w it was impossible to compete with Radio Moscow which put a monster signal into North America right in the middle of the novice band. Fortunately, I had seven xtals and could slip in between the broadcasters.

My novice receiver, an HQ-110, was a fantastic receiver for 40m CW, and a great companion for the AC-1. Key features included a Q-multiplier that allowed continuously controllable IF bandwidth and passband tuning, Also included was a tunable BFO, which allowed fully adjustable beat frequency down in the 200-400Hz range where our brain/ear system has good selectivity. How would a K3 stack up against an HQ-100/AC-1 combo in the 40m novice band of 1969? Happily for Elecraft, we will never know.

Notes:

The official definition of QRP as 5 watts or less did not come until the 1970s.

SCIENTIFIC TIDBITS

Fertilizer in Drinking Water

Nitrogen fertilizers have been accumulating in soils for more than 80 years, leaching into drinking water and contributing to a range of health problems. Indeed, even if farmers stopped using these fertilizers today, lingering "legacy nitrogen" would contaminate lakes, rivers, and ground water for another three decades. Environmental scientists analyzed more than 2,000 soil samples from the Mississippi River Basin and found a buildup of nitrogen 10 inches to 3 feet below the top layer of soil. Nitrogen is easily converted to nitrate, an inorganic compound that has become one of the most common drinking-water pollutants in the U.S., increasing the risk for thyroid cancer, birth defects, and a potentially deadly infant blood disorder known as blue-baby syndrome. A study at the University of Waterloo in Ontario shows the long-lived nature of nitrogen fertilizers in soil and water means it will take even longer for best management practices to have a measurable benefit. So what do we substitute for nitrogen fertilizers that will not pose the same pollution problem?

A New Mission to Mars

As NASA prepares to send its InSight spacecraft to Mars in about two years, Russia and the European Space Agency last month launched their joint ExoMars mission to the Red Planet from Baikonur Cosmodrome in Kazakhstan. Following a seven-month journey, the ExoMars spacecraft, known as the Trace Gas Orbiter, and its lander, which was dubbed Schiaparelli, after a 19th century astronomer, will separate. Schiaparelli will then descend through the Martian atmosphere and touch down on the planet's dusty surface in less than six minutes. Over the course of four days, it will conduct environmental experiments and test a new thermal protection material, a parachute system, liquid braking system, and an altimeter, which may all be used in future deep space missions. Meanwhile, the orbiter will circle Mars at an altitude of roughly 250 miles performing a detailed analysis of the atmosphere in search of methane, nitrogen, water vapor, and other gases associated with life on Earth. This series of missions is addressing one of the fundamental questions in science, "is there life anywhere else besides Earth? When considering the billions of galaxies in our universe and the number of exoplanets that exist, the odds definitely favor life similar to ours here on Earth existing in many more places throughout the universe. The trick will be to find it.

Brain-boosting Blueberries

Blueberries may help improve memory and brain function in older adults with cognitive decline. A study done at the University of Cincinnati giving the study group once daily over 16 weeks either freeze-dried blueberry powder (the equivalent of one cup of berries) or a placebo. The people who had taken blueberry powder saw their memory improve, finding it easier to retrieve words and concepts. Those changes were borne out in MRI scans that showed more intense brain activity in the blueberry powder group compared with subject given the placebo. A second study focused on a group who had not been diagnosed with cognitive impairment but felt as though their memory was on the decline. The participants were split into four groups and given either blueberry powder, fish oil, a mix of fish oil and powder, or a placebo. The results were not as robust as with the first study. Cognition was somewhat better for those with powder or fish oil separately, but there was little improvement with memory. This finding suggests blueberries may be most beneficial when cognitive impairment has already been established. I am taking no chances. My diet will now contain a healthy portion of blueberries daily!

Jim WB2EDO

Field Day 2016 Photos
Thanks to Jon AE2JP

Public Relations

Just in Case

Important Stuff

Up goes the Tower

The Hard Way

The Easy Way

Setup Complete.

Time for Lunch

The Stations

VHF

HF 1

HF 2