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 50 NO.12 December

UPCOMING EVENTS

Regular Meetings

1/11 & 1/25
Monday 7:30
NP Community Center

Kids Day 1/3/16
Check The Website

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

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WB2QOQ Rick Anderson
WB2EDO Jim Brown
K2UI Jim Stekas

Climatological Data for New Providence for November 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 November, 74 deg. F (November 6)
Last November(2014) maximum was 69 deg. F.
Average Maximum temperature this November, 57.2 deg. F
Minimum temperature for this November, 24 deg. F (November 24)
Last November(2014) minimum was 17 deg. F.
Average Minimum temperature this November, 37.9 deg. F
Minimum diurnal temperature range, 7 deg.(56 -49 deg.) 11/10
Maximum diurnal temperature range, 29 deg. (57-28 deg.) 11/26

Average temperature this November, 47.6 deg. F
Average temperature last November, 40.9 deg. F

PRECIPITATION -
Total precipitation this November - 2.47" rain
Total precipitation last November - 4.67" rain/melted snow; 3.0" snow

Maximum one day precip. event this November; November 19, 1.88" rain.
Measurable rain fell on 6 days this November, 8 days last November.

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Rick Anderson
12/27/15
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
-10

Amateur Radio Digital Voice Solutions

Jim Stekas - K2UI

ICOM has gotten behind a new Amateur Radio digital voice standard called D-STAR as an alternative to adopting commercial Land Mobile Radio standards in the ham bands. Like MotoTurbo (DMR), D-STAR supports both digital voice (3600 bps) and data (up to 1200 bps) in a 6.25kHz bandwidth. (On 1.2GHz D-STAR uses a high speed mode to operate at 100 kbps.)

D-STAR is a mostly open standard except for the incorporation of a proprietary AMBE codec implemented on a $20 chip. This rankles many hams, but if you're buying a commercial handheld it doesn't much matter whether the codec is proprietary or open source. What *does* matter is that the voice quality from the AMBE coder is a big step down from FM, and a D-STAR handheld costs a lot more than an analog one. Given that ICOM is the only D-STAR vendor, there isn't much price competition, but if you are going to plunk down $350 on a digital handheld, D-STAR gives you 2m coverage and backward compatibility with existing FM ham repeaters. Things you won't get with a DMR handheld.

Where D-STAR shines over DMR is on the repeater and networking side. With DMR, you are pretty much stuck with a $3K Motorola repeater and maintaining radio IDs and managing "talk-groups". D-STAR repeaters are available from ICOM, but many hams have built low cost D-STAR repeaters using Linux and open source software. There about 900 DMR repeaters operating in the US, a few of which are are in NNJ. (There are no ham DMR repeaters in the NYC metro area.)

Yaesu has also entered the fray with their System Fusion, which appears to be very well thought out. Fusion uses a bandwidth of 12.5 kHz (twice that of D-STAR) and supports good quality digital voice at rates of 9600bps. Fusion also provides modes for data, simultaneous voice+data and analog FM. Modulation is C4FM, which is compatible with most commercial land mobile standards: DMR, NXDN, P25, etc.

Networking between Fusion repeaters is based on the WIRES-X, a Yaesu VoIP protocol for connecting radios. WIRES-X has basic capabilities similar to Echolink, but is able transport digital voice packets from end-to-end in C4FM format. The simplicity of WIRES-X makes it easy to administer and cheap to implement. A WIRE-X node can be bought from Yaesu for about $100 or one can be built from a Raspberry Pi single board computer.

So, is it time to go digital voice? Yes, in the sense that it's about time we amateurs embraced digital voice like the rest of the wireless world. But it is unfortunate that what little VHF/UHF digital voice exists is split across multiple incompatible standards. It would be nice to see the ARRL take the lead in pounding out a standard for Amateur Radio, but they seem content to lay low and not put any ad revenue at risk. If you like being a part of the bleeding edge, this is a good time to jump in and help develop the technology that replaces FM.

References

ham-dmr.nl/?wpfb_dl=194 Comparison of amateur digital voice systems by W9HPX.
www.yaesu.com/pdf/System_Fusion_text.pdf Short overview of Yaesu Fusion.
www.icomcanada.com/dstar ICOM overview of D-STAR.

SCIENTIFIC TIDBITS

Small Size, More Power

A new micro-battery developed by a research team from Harvard's Wyss Institute and the University of Illinois at Urbana-Champaign. There has always been a tradeoff between the size of a battery and the amount of power it can provide, which is a limitation for many miniaturized devices for which weight is critical. One approach is to create very thin, lightweight batteries using thin-film deposition techniques. Because they are super thin, they do not pack enough power for many designs. The Harvard/Illinois team reasoned that, if they could come up with inks that have the right combination of chemical and electrical properties, it would be possible to create more powerful batteries using 3D printing techniques. Turns out they were right.

They concocted one ink for the anodes and another for the cathodes – each containing a different lithium metal oxide compound. These were deposited as layers on two gold combs to create an interlaced stack of anodes and cathodes. Then, all they had to do was drop the electrodes into a container and fill it with electrolyte. The result is functioning lithium-ion microbatteries the size of a grain of sand.

According to one of the team members, "The electrochemical performance is comparable to commercial batteries in terms of charge and discharge rate, cycle life, and energy densities. We're just able to achieve this on a much smaller scale." This breakthrough should be useful in the development of many types of smaller devices in a myriad of tiny devices.

Super Massive Black Holes

Astronomers have spotted the most enormous black holes ever detected, inspiring new theories about how such pocket of extreme gravity form. Together, the two objects, which are roughly 300 billion light-years away, have more mass than 30 billion suns, University of California at Berkeley astrophysicist Chung-Pei Ma tell the Associated Press. "They are monstrous," she says. The smaller of the two black holes is far bigger than any ever found before. Black holes are regions of space where gravity are so intense that not even light can escape; they can form when stars run out of energy and collapse into themselves. Every galaxy, including our own Milky Way, appears to have a black hole at its center, but until now all of those found have been much smaller. Since these new "supermassive" finds are far bigger than those left by any single dead star, scientists now wonder if they expanded by gobbling galactic matter or by merging with black holes inside other galaxies. Ma says these black holes might also be remnants of quasars that burned out in bright bursts of extreme energy during the early phase of the universe. Things like this makes one feel really insignificant in comparison.

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Jim WB2EDO