MOUNTAIN SPARK GAPS

NPARC—The Radio Club for the Watchung Mountain Area

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

VOLUME 48 NO. 7 July 2013

UPCOMING EVENTS

Regular Meetings

Mon. 8/12 & 8/26 7:30 PM
NP Rec. Dept. Workroom

Meeting Schedule

Regular Meeting: 7:30—9:00 PM
2nd Monday of each month at the
Salt Brook School Cafeteria
Springfield Ave. and Maple St.
New Providence

Informal Project Meeting: 7:30—9:00 PM
4th Monday of each month at the
Salt Brook School Cafeteria
Springfield Ave. and Maple St.
New Providence

Everyone is Welcome
If a normal meeting night is a holiday, we usually meet the following night.
Call the contacts below.
When Schools are closed,
Meetings are held in the Recreation Department Meeting Room in Borough Hall

Club Officers for 2013

President: K2MUN David Berkley
908-500-9740
Vice President:KC2WUF David Bean
973-747-6116
Secretary: KC2HLA Hillary Zaenchik
908-244-6202
Treasure: 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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Contributing Editors:
WB2QOQ Rick Anderson
WB2EDO Jim Brown

Climatological Data for New Providence for June 2013

The following information is provided by Rick, WB2QOQ, who has been recording daily weather events at his station for the past 32 years.

TEMPERATURE -
Maximum temperature this June, 95 deg. F (June 24)
Last June(2012) maximum was 95 deg. F.
Average Maximum temperature this June, 83.5 deg. F
Minimum temperature for this June, 50 deg. F (June 5)
Last June(2012) minimum was 47 deg. F.
Average Minimum temperature this June, 61.3 deg. F
Minimum diurnal temperature range, 12 deg. (67-55 deg.) 6/13
Maximum diurnal temperature range, 28 deg. (87-59 deg.) 6/22

Average temperature this June, 72.4 deg. F
Average temperature last June, 71.0 deg. F

PRECIPITATION -
Total precipitation this June - 8.61" rain
Total precipitation last June - 2.82" rain

Maximum one day precip. event this June; June 7, 3.33" rain.
Measurable rain fell on 14 days this June, 12 days last June.
This June is the third wettest June at this station in 31 yrs.
(June 2003 = 9.27"; June 2001 = 9.08")
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Rick Anderson
7/1/13
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

More Field Day 2013

Welcome Visitors

Ready to Raise

Food & VHF Tents

VHF Tent Interior

Overview

After an All Nigh Shift

Thanks to David, KC2WUF for the photos.

PRESIDENTS COLUMN
By K2MUN

Last month I talked about our NPARC Field Day. Now, Field Day 2013 has been submitted to ARRL and we will wait some time for national results.

During the discussion of Field Day I mentioned propagation forecasts and provided a couple of references to current results and research. I also hinted that I wanted to go more deeply into this subject. I hope to have a chance, at some point this year, to make a club presentation on the subject but, for the moment, let me just whet your appetites.

First, what are we talking about when we talk about 'propagation' forecasts. Primarily, this subject refers to long-range radio transmission on the HF bands and deals with the physical variables that affect such transmission.

This isn't to say that 'propagation' isn't vital to communications on other bands. Many of the same solar and atmospheric phenomena that affect HF also apply to the 'Magic Band' -- 6 meters, but with twists that those who frequent that region of our spectrum know well. By the time we hit VHF and UHF global, solar mediated, effects are not really that important. The major effects that are important on these bands are 'local' in the form of locally generated noise, some natural such as thunderstorms and some human produced in the form of noisy electrical devices. These can also have an equal or even stronger impact on HF communications.

However, the big global HF player is the sun. The sun sends us two types of messages: Radiation and particles. When these hit the earth (the radiation in minutes the particles in days) they cause complex events including spectacular displays of Aurora as well as enhancement or interference with our HF radio propagation. Even with a quiescent sun, there is a regular daily variation in propagation, caused by the sun, as the earth rotates under its life-giving rays.

Before trying to understand 'space weather', those variations in solar behavior from the 'norm', we first should get some sense of 'normal' behavior.

Most of the effects that mediate global HF propagation happen in the upper atmosphere or the 'ionosphere.' This region isat heights above the earth that roughly range from about 50 km to as high as 1000 km (Exosphere).

Traditionally, the ionosphere is divided into three major layers (D, E and F) with the uppermost, the F-layer, subdivided into F1 and F2. The UV and X-ray radiation from the sun strips electrons off the gases in the atmosphere resulting in positively charged ions (hence 'iono-sphere') and free electrons. Depending on their density and the frequencies involved, these ion layers can absorb or reflect (or both) radio waves that enter that region of the ionosphere.

The reflections are what makes communications via HF possible over exciting globe girdling distance while the absorption causes disappointment. This dance of ions, and sometimes particle showers from the sun, is the magic that, for me, makes radio the mysterious and exciting hobby it is. The physics of propagation (not to mention the sun itself) is amazing, and understanding it can greatly enhance our ability to communicate where and when we want.

After this column was drafted, QST arrived with an interesting, idiosyncratic (not surprising for a ham operating from interior Alaska), article on propagation: "Don't Blame the Sun," by Eric Nichols, KL7AJ (QST, August 2013, 97, pages 40 - 41). If you find this subject interesting the article is well worth reading.

In future columns I plan to address how we, as hams, can use the deep science now available to understand and predict HF behavior. Understanding something of that underlying physics can enhance our hobby and simple, inexpensive (and free), tools can give very specific insight into what is possible at any given time.

BET YOU DIDN'T KNOW

Early politicians required feedback from the public to determine what the people considered important. Since there were no telephones, TV's or radios, the politicians sent their assistants to local taverns, pubs, and bars. They were told to 'go sip some Ale and listen to people's conversations and political concerns. Many assistants were dispatched at different
times. 'You go sip here' and 'You go sip there.' The two words 'go sip' were eventually combined when referring to the local opinion and, thus we have the term 'gossip.'

SCIENTIFIC TIDBITS

Vulnerability of Networked Embedded Systems

Today just about everything can be networked with embedded hardware. Take automobiles as an example. Besides the obvious wireless connectivity for your cell phone and GPS, the brakes, headlights, wipers, radio, and transmission are all monitored, controlled, and connected by microcontrollers. At home, there's a wireless monitor for humidity in with an alarm set to sound if humidity drops below 45%. There's also a wireless network of smoke and CO detectors that sound at the first hint of a fire.

It has been assumed for years the major cost of ubiquitous embedded system networks is low-level radiation from Wi-Fi hot spots and Bluetooth devices. That is not the only cost, however. The problem with networked embedded systems as they grow more powerful and more ubiquitous is the potential for harm.

It is one thing for a government to remotely destroy the equipment purportedly used to make nuclear weapons, but quite another for someone to change the setting on your IV drip while you are in the hospital. Or, to cause your car's anti-skid brake system to lock up as you accelerate to pass another vehicle. How about someone who remotely shuts off the oxygen system to an aircraft cabin? Or, what if someone in a parked car outside your home had the ability to shut down your pacemaker?

The problem with malicious embedded system crashes is that they can result in physical crashes, as opposed to the soft crashes on a computer screen. Recognizing this, DARPA and other government agencies are funding research to develop means of automatically detecting and patching vulnerabilities in networked, embedded systems. This is not a small task. The difficulty in handling malware on desktop computers is difficult enough. You have to first identify the malware with a program such as McAfee or Symantec et cetera. Then you have to get rid of the malware and patch the corrupted software. If this doesn't get rid of the malware, then you will probably have to re-format your hard drive. It is obvious that society is wide open to cyber mischief such as this, and at the moment there is no defense.

For now the operative word is vigilance as there is no standard security library for the Arduino, Propeller chip, or other popular microcontrollers capable of automatically identifying and eradicating malware. Unfortunately, as with malware for the big iron, as soon as protection becomes standardized, the malware makers will adapt. Perhaps it might be a good time to buy stock in a diversified list of malware protection companies? The threat is definitely there and will only get worse over time.

It is very true; we live in a very dangerous world.

Jim WB2EDO

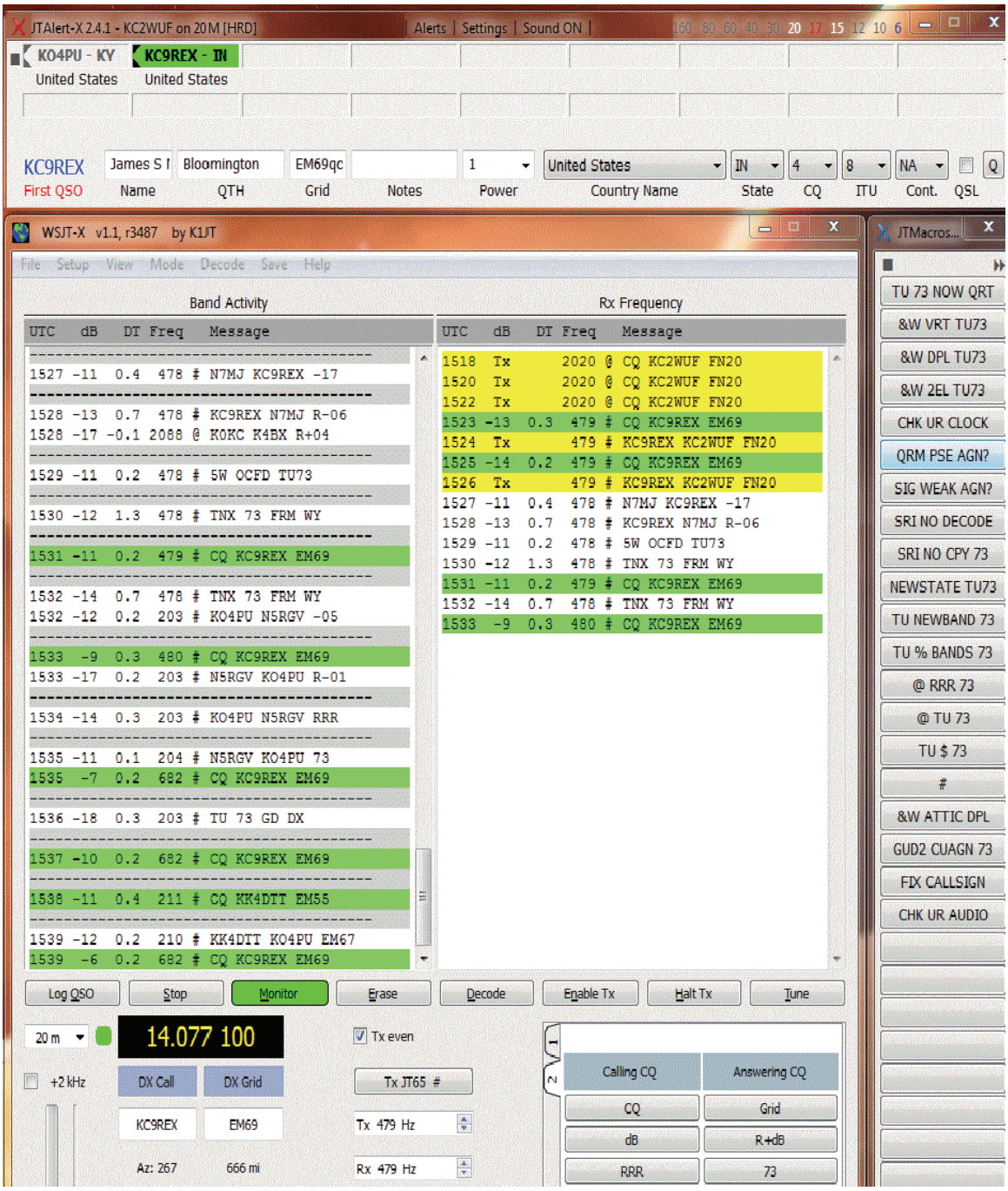
Digital Notes

by David Bean KC2WUF

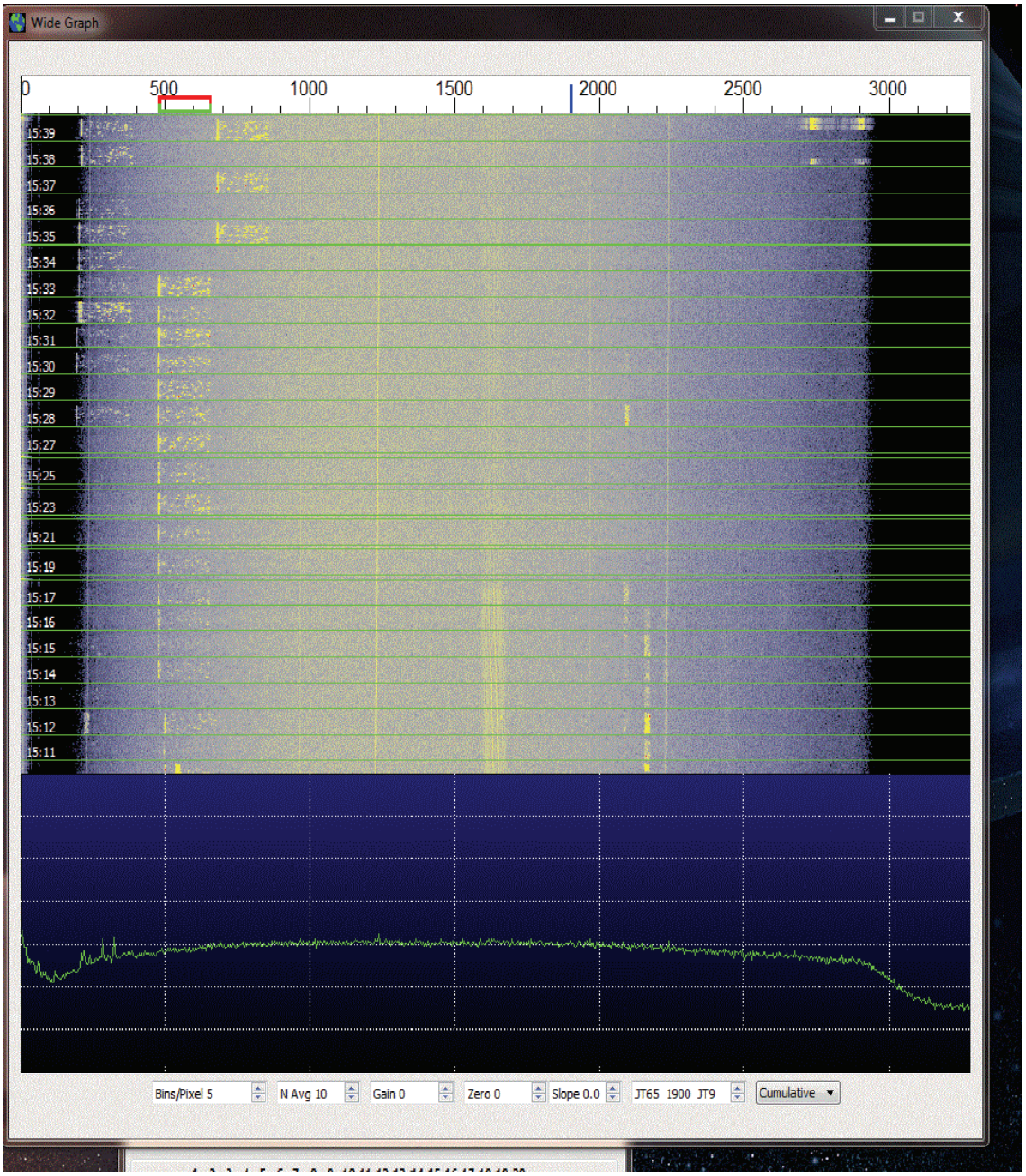
As I start writing this column (July 18, 2013), I am testing (utilizing) the recently published beta release of WSJT-X v1.1 which incorporates a dual-mode decoder into the WSJT-X software. Joe K1JT and the rest of his project team have been hard at work on this since the "production" release of WSJT-X v1.0 that I wrote about last time. The software starts with an alpha test team and then over a week ago came an unpublished beta release to the people on the various group reflectors on both Google and Yahoo! Groups. I did a little testing of that release, but the discussion was limited and the JT-Alert software didn't handle the JT65 decodes properly. Once the beta was published on the WSJT-X web page, Laurie VK3AMA released an updated version of JT-Alert that handles the dual-mode decode capability of the software.

The dual-mode decode capability of the WSJT-X software means that it can now decode both JT65A and JT9-1 in the same RX pass-band. To support this, the software now supports RX pass-bands as wide as 5 kHz (if your receiver allows). The neat thing it does since most rigs have a 2.7 kHz TX pass-band, is to operate split such that the transmit audio is always between 1000 and 2000 Hz. Because the normal JT9 sub-band is 2 kHz higher than JT65 on most HF bands, you can now work both modes at one time. Even with my Yaesu FT-950 I am able to work the upper half of the JT65 sub-band and the entire JT9 sub-band by carefully choosing the proper frequency. For 20 meters, I am using 14.077.100 USB with the 15 kHZ Roofing Filter which allows me to see just above the middle of the normal JT65-HF JT65 sub-band at 300 Hz all the way to the top end of the JT9 sub-band at 2900 Hz. If you have a rig with one of the wider RX pass-bands (4-5 kHZ), you can set the QRG to 14.076.000 and see both the standard JT65-HF sub-band along with the entire JT9 sub-band. Rigs possessing wider RX pass-bands include several Kenwood rigs, many top-end rigs and most SDR rigs.

For those who only want to work a single mode,, especially if you have a narrower RX pass-band, (2.0-2.7 kHz) you can choose to do this as well. They have included a +2 kHz check-box on the left side of the controls (lower) section of the main window with which you can jump from the normal JT65 sub-band up to the JT9 sub-band. Switching back and forth between the 2 modes is available through a button in the center of the bottom part of the window.



Typical monitor display during WSJT-X v1.1 dual-mode operation. (left side)



Typical monitor display during WSJT-X v1.1 dual-mode operation.
(Right side)

In the photo, you can see what my second monitor (I run a dual-monitor setup) typically looks like during a dual-mode WSJT-X session. In addition to the two windows for the WSJT-X software (WSJT-X and Wide Graph) are the 2 JT-Utilities (JT-Alert and JT-Macros) along with my Elecraft W2 Wattmeter monitor (slightly obscured by the Wide Graph). Apparent in the waterfall are 1 kHZ spaced tones common in SignaLink USB devices along with wide striping QRM from my LCD monitors starting at approximately 1600 Hz. Yesterday I saw as many as 14 simultaneous decodes during the same cycle, so the screen can become a little crowded.

In support of this dual-mode decode capability, Laurie VK3AMA has updated his JT-Alert software to support the greater number of decodes and the dual-mode decodes. First thing is an option to support a second row of decoded callsigns, which is close to being used up on 20 meters already. The second is he rewrote the alert tracking data-base to always compute alerts by band (WAS, DXCC, Grid, Continent, etc.) for all mode criteria (any mode, any digital mode, JT65 and JT9) instead of per your selected options. The alerts can be triggered by if you've worked, verified by eQSL or verified by LotW the award entity. Third, he has added a simple IM to the software allowing simple text messages to be passed to other users of JT-Alert. It isn't robust, so no guarantees that it gets through, but it is a neat concept.

Anyway, that is all I have for now. I hope some of you get up the nerve to try out the software. For those of you running Linux or Mac OS, they are working on creating releases of WSJT-X for those platforms as well. Further information is available on the WSJT-X web page. If you aren't running Windows you will have to do without the JT-Utilities since they are written specifically for Windows.

As I finish this column today (July 24, 2013), not only has the “production” Windows release been posted on the WSJT-X web page, but they have also posted Ubuntu releases for the 4 most recent versions (12.04, 12.10, 13.04 and 13.10). They also have set up a placeholder for a future link for OS-X for you Mac operators who'd like to run natively. You will probably also see an article about this dual-mode capability in QST very shortly.

Useful Links (again)
WSJT-X Page - http://physics.princeton.edu/pulsar/K1JT/wsjtx.html
JT-Utilities Page - http://ham-apps.com/
PSK Reporter map - http://pskreporter.info/pskmap.html
HamSpots Home Page - http://hamspots.net/
JT65-HF Download Page - http://sourceforge.net/projects/jt65-hf/
JT65 Reverse Beacon (RB) Site - http://jt65.w6cqz.org/receptions.php

(If this is messed it is the fault of your editor, not the author)