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NVARC
Nashoba Valley
Amateur Radio Club

SIGNAL

A club since 1992
Since 1993
Since 1996

de N1NC October 2020 Volume 29 Number 10

In this Issue

Last Month's Meeting

The September meeting featured Phil, W1PJE, speaking on "A history, and an Inside Tour, of NIST Station WWV".

This Month's Meeting

The October meeting will feature George, K1IG, discussing Astron Power Supplies.

From The Prez: a Battery Challenge!

***de* Jessica, WU3C**

Introduction:
This proposed contest is the "new – Jessica" version of the lantern battery challenge. It is in the spirit of the original Lantern Battery Challenge, But a little different! This is crafted to encourage building things, working members, being creative and learning new things. It is a real challenge, not only to operate, but to build equipment and craft a strategy! Look up the old Lantern Battery Challenge in September 2014 Volume 23 Number 9 of NVARC Signal for some valuable tips from Bob, W1XP. Here's the proposed scoring formula; the terms are defined in the text below:

$$Points\ per\ QSO = \frac{1{,}000{,}000}{\left[\begin{array}{c} Club\ Member\ Status * \\ 10^{antenna\ gain\ in \frac{dBm}{10}} * \\ HAAT^{1}\ Divisor * \\ Band\ Divisor * \\ Bandwidth\ in\ Hz/100 * \\ ComputerAssist\ Divisor * \\ Homebrew\ Divisor * \\ Tube\ Divisor * \\ tx\ rx\ \ Divisor * \\ \#\ of\ cells^{2} * \\ (\#\ of\ recharges + 1)^{2} * \\ \frac{1}{\#solar\ recharges + 1} * \\ \frac{1}{(\#\ human\ recharges + 1)^{2}} \end{array}\right]}$$

It may seem complex at first look. Let me entice you to look a little harder and realize that isn't so. I will do that by describing some ways you can participate with ease.

Example #1, you can use a handi-talkie on 2M and work club members and get a good score.

Example #2, you can use a FT-817, a KX2 or 3, or a phasor kit on 20M with FT8 and do quite well.

Example #3, you could use a commercial rig with the power dialed down and recharge with solar power operating in one or two contests and be competitive!

Example #4: you could use a home brew CW transceiver on 23cm, and work your neighbor who happens to be a club member every day and get a decent score!

There are a lot of ways to get a good score through operator skill, home brew skill, strategy and cleverness,

[1] "Height Above Average Terrain"

engineering skill, or just straight up brawn. It is "everyone's" battery power contest.

For interested parties, we will have a session on Zoom to talk through all the details and questions. I still have to work out logging, and I am thinking (at W1XP's suggestion) that I may be able to build a custom contest in N1MM. Stay tuned for that. Now for the rules:

The rules:
First off, what most people asked me about when I talked about this idea is some variation about cheating. Yes, you can cheat. Do so if you need to win that badly, no one will ever know! OK that is out of the way!

Next, there are no classes. Rather there is a QSO scoring equation. Why? Because this way you can operate anything any way you want so long as it is battery powered. Every QSO can be a different band, mode, power, antenna, etc. So, you can operate this contest with almost anything. I will get back to the scoring equation later in this text. I am a huge fan of Home Brew and Tubes, so there is some built in incentive. Operating tubes off batteries is hard, so there is a big incentive!

The power source: You must use 18650 LiPo cells. You can use however many you want, and you can recharge them! Yes, you can recharge them! But see the scoring equation, as it will be obvious that having 100 cells and recharging them every day will get you a lower score than a frugal QRP rig.

The club will provide 4 cells and a charger that will power a 12V radio. You can use more but you have to build it! Only actual home brew radios will count toward the score divider, not the power sources.

Ok recharging: you can use any power source you want to recharge the 18650 cells. You cannot recharge while operating.

Your score gets divided by the SQUARE of the number of times you recharge though. Using Solar or human power to recharge will increase your score. Solar gets you a square root credit, human power gets you an equal credit. That means, you can use a human powered rig all you want! Go Exercise! Note, that any recharge, even partial, must be reported as a recharge – so use up the charge as much as possible, then recharge them all the way!

An example – if you have a 12-cell battery pack, and you recharge it 10 times, you divide your QSO score by (12^2+11^2) = 144+121=265!! Yes, DIVIDE your score by 265! Low power will win this contest. That is the spirit of the lantern battery challenge.

My jazzercise addition: If you have an 8-cell pack, and use human power to recharge it 100 times, that will be divide QSO by 64, divide QSO by 10201, multiply QSO by 10201 = divide QSO score by 64. Exercise will win! Woot! Cheaters will be obvious by waistlines. Haha.

Daily dupes and Members: Working a NVARC member is worth 10x more than non-members. You can work any call sign, be it a member or not, as many times as you want, provided it is one unique configuration per QSO per day. That means you have to change something in the scoring equation. In working the same call again, if what you do does not change the equation, it must wait until 24 hours later. For example: you could work a call on CW, phone, and FT8 on 20M. You could work them on phone on 6m, 2m SSB, 2M FM, and 440FM. So pretty easy to stack up some points there!

Bands: There is incentive to use "hard" bands also. Low bands and microwave bands are worth way more. Check out the divider table for the bands below:

Table 1: Band Divisor

Frequency Band [m]	Divider
2200	0.5
630	1
160	2
80	3
60	3
40	5
30	5
20	10
15	10
10	10
6	10
2	5
0.7	3
0.33	2.5
0.23	1.25
above	1

Modulations: The divider for the modulation is simply the required signal BW divided by 100. That makes FT8 look pretty good, but using a computer assist is costly. For the purposes of this contest CW will require 100Hz BW. SSB is 2.1Khz, FM is 5KHz. Everything else is as it is advertised: for example, PSK31 is 31Hz, FT8 is 50Hz.

Computer assist means any method that requires a computer separate from the radio to operate. Don't get all lawyerly on me. You can figure this out without being a "you know what." So, all WSJT modes are computer assisted. Using CW skimmer to copy CW is computer assisted. Using a DX spotter is NOT computer assisted (not required to make the contact.) Mechanical RTTY would not be computer assisted. If you have a Model19 teletype and an analog MODEM, you Go!

Home brew: if you needed to solder to make the radio, it is home brew. Kits OK! If you designed it yourself, you are SUPER AWESOME! But it counts the same. UNLESS you home brew a tube battery radio! Then you get 10X more points per QSO!! As I mentioned, this does not include the power source. So mono-band phasors are home brew! GoooooOOO Kits!

Leveling the antenna playing field: Many of the old classes were about this. I propose something different. That is to make everyone equal including by location, there is a divider for antenna linear gain relative to a dipole. Secondly the log of the HAAT as computed by the FCC website (https://www.fcc.gov/media/radio/haat-calculator).

It is probably hard to figure out your antenna gain – but if you have a commercial antenna use the specs. If you have a wire antenna of any sort less than 1 wavelength long, use 0dB (1x). for a multi wavelength random wire, use 0dBd (1x.) If you have a rhombic, beverage, or other multi-wavelength wire gain antenna or an array, I bet you can figure out what the gain is. Honor system people!

OK the scoring equation:
There are 13 dividers for EACH QSO. Each QSO can use a different rig, antenna, battery, etc. But the QSO's that use a particular battery must be logged against that battery.

For any QSO: start with 1,000,000,000 (One Billion!) points. Then Divide that number by:

1) If it is a club member (1), if it isn't (10)
2) $10^{(\text{Antenna gain in dBd}/10)}$
3) If HAAT is positive, $10*\log_{10}(\text{HAAT}/10)$, if it is negative $1/(10*\log_{10}(\text{absolute value(HAAT)}/10))$
4) Frequency band divider from Table 1
5) Required modulation BW in Hz/100
6) Not Computer assisted (1), Computer assisted (100)
7) Home Brew Radio (1), Not home brew (5) [Home brew by YOU!]
8) Tube Radio (1), Not tubes (10)
9) TX and RX battery powered (1), RX not battery powered (5)
10) Number of cells in battery used for this QSO SQUARED (n^2)
11) (Number of times this QSO's battery has been recharged +1) SQUARED: $(n+1)^2$
12) 1 / (number of solar charges on this QSO's battery +1): (n+1) [not squared!]
13) 1/ (Number of human power charges on this QSO's battery + 1) SQUARED: $(1/ (n+1)^2)$

For example:

A QSO using your battery pack #1 with a club member, which is 4 cells. The QSO is on 80M CW using a solid-state commercial radio. You have a dipole antenna and your FCC HAAT is -100. You recharged that battery 2 times using solar power:

1,000,000,000 / (1 * 1 * 0.1 * 3 * 1 * 1 * 5 * 10 * 1 * 16 * 9 * 1/3 * 1) = 1,388,888 points

Another example (of how to not do well):
A QSO using your battery pack #2, with 20 cells, with a non-member, never recharged, on 20M SSB, home brew Tube radio TX, with a beam on a tower with HAAT of 80m and a gain of 10dB using an SDR RX:

1,000,000,000 / (10 * 10 * 9 * 10 * 21 * 1 * 1 * 1 * 5 * 400 * 1 * 1 * 1) = 2.65 points

Another example:
A QSO using a 8 cells pack, recharged 4 times with shore power, with a member, using a commercial radio, on 2m FM, with a duckie. (estimated gain -6dBd) with a -100m HAAT:

1,000,000,000 / (1 * 0.251 * 0.1 * 5 * 50 * 1 * 5 * 10 * 1 * 64 * 25 * 1 * 1) = 1992 points

Another example:
A QSO using a Phasor 40M radio working a member, using a dipole at 0 ft HAAT, a 4 cell battery, never recharged, FT8 mode:

1,000,000,000 / (1 * 1 * 1 * 5 * .50 * 100 * 1 * 10 * 1 * 16 * 1 * 1 * 1) = 25,000 points

Logs:
The Log must include the Callsign, Frequency, UTC, Mode, the report appropriate for the mode and contest if so worked, Battery ID if using more than one pack for different configurations, and all thirteen divider factors. Logs will be preferred to be submitted via computer in Excel format with a photo of the station set up for making a big collage to be used in the amazing fabulous awards! Some details to be worked out here.

Dates and logistics: This I am still working out – it would be helpful to know how many people are interested. I am thinking that it will run from Jan1 to Field day. Then all the admin can be done after field day.
As mentioned, I am hoping to have a custom N1MM contest to do this.

Awards:
Of course, these will be fabulous. There will be:
High score,
Most QSO's
Highest score to QSO ratio
Highest Score to cells used
Highest score to recharges used
Least number of cells used, ties by score
Least number of recharges, ties by score
Lowest power QSO, ties by score
Highest power QSO, ties by score
High Scores single bands
Most members worked
Most Counties
Most States
Most Countries
Most heart ache (by shared anecdotes)
Best home brew, (judged by photo and description)
Best tube home brew, (judged by photo and description)
Best human powered, (judged by photo and description)
Bonus Award for something extra AWESOME that just doesn't fit anywhere else.

-*de* Jessica, WU3C

-*de* Joe, K1YOW

NVARC is on Facebook

The Nashoba Valley Amateur Radio Club now has a Facebook page! Just search in your browser for "NVARC Facebook" to find the page. Searching on just "NVARC" will get lots of hits for other sites.

If you are a Facebook member, please log in, send us a "like", if you like, and post a comment or question.

Saturday Morning NVARC Breakfast

John, K1JEB, has been hosting Saturday morning "NVARC Zoom Breakfasts" that do a good job at recreating the conversational benefits that some of us miss not having Tiny's at which to congregate

John sends instructions on how to join via the NVARC mailing list. Keep an eye out!

Also: Tiny's IS OpenForBusiness. If you are venturesome join the several members that *have* been meeting at Tiny's.

Meteor Scatter?
de Les, N1SV

Have you tried to make a VHF contact via meteor scatter (MS) yet?

While I've witnessed it on Mt Greylock from time to time but I hadn't attempted it from the home QTH until recently.

For the past couple of weekends I've tried to experiment with it on 6m. This morning I finally was able to work both K0TPP in MO (1,031 miles) and W9VHF in IN (696 miles). Both were worked with 100w and using the MSK144 mode on 50.260 MHz

If anyone wants to give this a try it's pretty simple. If you have a 100w 6m SSB transceiver, a directional antenna, a sound card, and WSJT-X, then you have everything you need.

There is chat page for discussing MS, including setting up skeds, making announcements, or just discussing the topic at www.pingjockey.net. On weekend mornings before 9AM you can see stations on www.pingjockey.net announcing what frequency they are on and what direction they are pointed in.

While 6m is the easiest band to experience MS on, its also very popular on 2m and to some extent on 222 and possibly 432 MHz as well. At increasing frequencies however openings are shorter and the signal strengths are significantly less. Several times a year there are showers of meteors with many more meteors per hour entering our atmosphere. Here is a link to a listing of upcoming meteor showers https://www.amsmeteors.org/meteor-showers/meteor-shower-calendar/ .

The most popular communications mode for MS is MSK144 which uses 15 second transmissions. Using WSJT-X you can view pings on the programs fast graph. The WSJT-X online help has some tips for setting up MSK144 for the first time. Now that I've dipped my toe into the MS water maybe next weekend I'll try

2m? Coming up in November is the largest meteor shower of the year, the Leonids!

73! -de Les, N1SV

More on Meteor Scatter

de Joe, K1YOW

I have been playing with meteor scatter for a few years now. Like Les, it is 6m 100W and MSK144. I have almost made contacts on 2M (144.150) but 100W is very marginal on 2m. Most folks run around 400W up there. I have been heard on 2m MSK144 in the mid-west, but no contacts there yet. A bunch of contacts on 6m 50.260.

There is one feature in WSJT-X MSK144 that is really useful when it gets crowded during a meteor shower – you can call CQ on you frequency and listen on another and when a station hears your CQ and double clicks on you, WSJT-X will automatically shift you and the other station to the Rx frequency. There is a trick – the logic seems backwards.

For example, you can put other frequencies into WSJT-X like 50.265, 50.270, 50.255, 50.250. Then you go to one of those frequencies like 50.265 and before you call CQ, you check the CQ box that has 260 in it. Then when the CQ goes out, it does so on 50.260 and looks something like: CQ K1YOW 265. You call CQ on 260 but listen on 265 and anyone who double clicks on you calls you on 265 and the QSO happens on 265. That takes QSO traffic off of the calling frequency of 260. No problem under normal conditions when the rocks are sparse – just use 260.

The other hint is that we in the NE are as far East as you can get with the Atlantic to our backs, so we use the 2nd odd (15, 45) second time slots in a 15 second sequence. That way we can all Tx and not QRM each other. There will be some exceptions, but the rule of thumb for us is to Tx in the 2nd odd 15s slots.

One other operator note: Es and tropo really mess things up for meteor scatter from a congestion QRM point of view. The main idea is that multiple stations can be Tx-ing in the odd 15s slots here, and they can work multiple stations in the mid west and SW at the same time because the signals hit different ionization trails at different angles. When we get tropo and Es, then you hear multiple stations on the other end that QRM each other.

Around a month ago I was calling CQ on 50.260 looking for meteor scatter and a station in South Dakota came back to me on tropo. I worked him on MSK144 and then switched to FT8.

We are starting to try 10m using JT9f and JT9e fast. That is a work in progress. I have made several contacts. That is really where Ping Jockey helps out.

It is fun and QSOs can go from around a few minutes to 30 minutes. Patience is the word of the day. On long QSOs you can brew more coffee and take a bathroom break. LOL.

73,

-*de* Joe, K1YOW

NVARC to offer Technician License Classes

***de* Bruce, K1BG**

Bruce, K1BG, will be conducting on-line technician classes beginning on Monday, November 2nd. Classes will run twice weekly for four weeks, on Monday and Wednesday nights. Each class will be two hours long and run on Zoom.

The class will be limited to 15 students, and preference will be given to family and friends of NVARC members. Cost of the class will be $30 and will include textbook material. For more information, please contact Bruce, K1BG, at 508-341-5124.

-*de* Bruce, K1BG

New Slow Speed (Con)Test

***de* Bruce, K1BG**

For those of you who are excited about operating CW in activities like Field Day or other contests, but aren't sure how to develop your CW skills, there is an exciting announcement that I would like to share.

Several members of CW Ops and K1USN, a club based in Braintree MA, has established a "slow speed" contest, the "SST". The Slow Speed Test is designed to encourage those who are trying to develop their contesting skill and others who feel like "taking it slow and easy" once per week both for their own pleasure and to help others out.

SST has a maximum speed of 20 words per minute (WPM), and many operators can be found operating at 15 WPM or slower.

It's held every Sunday night for an hour beginning at 8PM local time, on these suggested operating frequencies:

80 meters: .532 - 3.539 MHz.
40 meters 7.032 - 7.039 MHz.
20 meters: 14.032 - 14.039 MHz.

The exchange is a simple: name and state.

This week, I had my CW Academy students Zoom into my shack, and we made contacts in a "live" situation.

I had my students copying the callsigns of stations calling CQ and the exchanges, and when they were successful I went ahead and worked the stations.

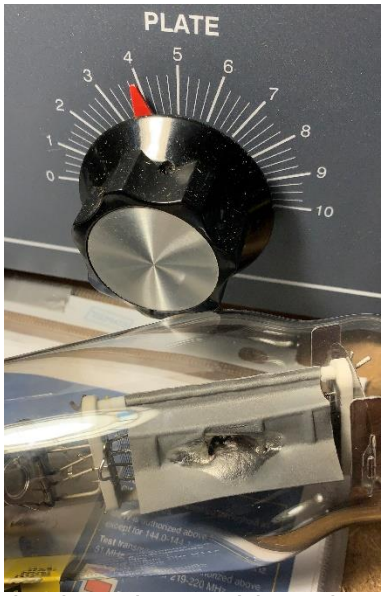
We worked a total of 12 stations during the hour and had lots of fun, and the bands were VERY busy. For more information, go to http://www.k1usn.com/sst.html. If you have any questions, please contact me at K1BG.bruce@gmail.com. I plan on participating next Sunday night.

de Bruce, K1BG

From the Shack
de George, KB1HFT

It's been a crazy month, and I haven't been on the air much at all since I blew up my AL-811H. Again!

Hmmm. Pushing the envelope too far, and not watching one's plate current can pretty much destroy an 811A. Here's a shot of the melted plate of one of the tubes. That counts as an "oops":



The AL-811H is a quite popular, basic, 4-tube, grounded grid amp. It is relatively straightforward to change out the 811s, but further disassembly is not easy.

One takes great care when dissecting such a beast.

The big orange label on the power transformer informs me "DANGER – Fatal Voltage". Yow, not just "High Voltage"!

I'll keep one hand in my back pocket, as I have been advised.

Nor have I worked on the 20m Phaser Kit, as domestic duties have distracted. Hopefully, I'll be able to report progress on these fronts next time.

-de George, KB1HFT

Board Meeting 1OCT2020

Attendees:

Ralph KD1SM,
John KK1X,
Bruce K1BG
George KB1HFT
Jim N8VIM,
Jim AB1WQ,
Jessica WU3C,

- Jessica to begin work on 18650 Challenge now that she has bandwidth.
- New Adverts for newsletter from Fran at Electronics Plus in Littleton and Ham Radio Outlet in Salem NH.
- Owen in contact with Bruce
- Bruce working on license class pricing options. Some have already signed up.
- Approved expenditure of up to $105 to subsidize 15 ARRL Technician Manuals for a class of 15 students.

-de John, KK1X

Treasurer's Report

Income for September was $30 in membership renewals. No expenses were recorded.

Current balances:

General fund	$2,378.91
Community fund	$5,948.25

As of 1 October, we have 46 members who are current with their dues and 18 renewals outstanding. Thank you to those of you who mail your renewals or use PayPal. Renewal months are in the member list on www.n1nc.org in the Member's area.

To pay membership dues via PayPal see the instructions in the same Members area.

Please remember to **UNCHECK** "Paying for goods or a service' **before submitting** your payment via PayPal. **If you neglect to do so, you are costing the club an unnecessary PayPal fee.** (Besides, you are not paying for goods or a service.)

If you are joining ARRL or renewing your membership please consider letting Ralph send in the paperwork for you. The Club will buy the stamp and will get a commission from ARRL.

ARRL membership checks should be made payable to NVARC; Address: NVARC, PO Box 900, Pepperrell, MA. 01463-0900.

Ralph deducts the Club commission before forwarding your paperwork to Newington. As an ARRL Special Service Club, the ARRL expects a majority of Club members to also be ARRL members.

de Ralph KD1SM

STRAYS

Tube testing, back in the day. Note the necktie & properly folded handkerchief. I expect he's wearing cufflinks. Times change: this ain't your grandfathers Amateur Radio!

Fun Fact The Galvin brothers:

Calendar

W1AW Schedule

PAC	MTN	CENT	EAST	UTC	MON	TUE	WED	THU	FRI
6 AM	7 AM	8 AM	9 AM	1400		FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
7 AM-1 PM	8 AM-2 PM	9 AM-3 PM	10 AM-4 PM	1500-1700 1800-2045	VISITING OPERATOR TIME (12 PM-1 PM CLOSED FOR LUNCH)				
1 PM	2 PM	3 PM	4 PM	2100	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
2 PM	3 PM	4 PM	5 PM	2200	CODE BULLETIN				
3 PM	4 PM	5 PM	6 PM	2300	DIGITAL BULLETIN				
4 PM	5 PM	6 PM	7 PM	0000	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE
5 PM	6 PM	7 PM	8 PM	0100	CODE BULLETIN				
6 PM	7 PM	8 PM	9 PM	0200	DIGITAL BULLETIN				
6:45 PM	7:45 PM	8:45 PM	9:45 PM	0245	VOICE BULLETIN				
7 PM	8 PM	9 PM	10 PM	0300	FAST CODE	SLOW CODE	FAST CODE	SLOW CODE	FAST CODE
8 PM	9 PM	10 PM	11 PM	0400	CODE BULLETIN				

W1AW's schedule is at the same local time throughout the year. From the second Sunday in March to the first Sunday in November, UTC = Eastern US time + 4 hours. For the rest of the year, UTC = Eastern US time + 5 hours.

♦ Morse code transmissions: Frequencies are 1.8025, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675, 50.350, and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 10, 13, and 15 WPM.

Fast Code = practice sent at 35, 30, 25, 20, 15, 13, and 10 WPM.

Code bulletins are sent at 18 WPM.

For a very detailed look at amateur radio happenings, and contests, check out:

https://www.contestcalendar.com/perpetualcal.php

NVARC Calendar

October

15 K1IG discussing Astron Power supplies.

November

19 Paul Topolski, W1SEX, will discuss the proper use of an Oscillo-scope

December

17 NVARC Monthly WebEx Meeting: Homebrew Night

January

15 NVARC Monthly WebEx Meeting: Member's Short Subjects Night

Sponsors

NVARC

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Vice President: Jim Hein, N8VIM
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Treasurer: Ralph Swick, KD1SM
Board Members:
Bruce Blain, K1BG, 2018-2021
Jim Wilber, AB1WQ, 2019-2022
Skip Youngberg, K1NKR, 2020-2023

Property Master: John Griswold, KK1X
Librarian: Peter Nordberg, N1ZRG
Emergency Coordinator: [open]
N1NC Trustee: Bruce Blain, K1BG

Join NVARC! Annual membership dues are $15; $20 for a family.

NVARC general meetings are scheduled for the third Thursday of the month at 2330 UTC (7:30pm, Eastern Time).
Non-members interested in attending may send an email to meetings@n1nc.org requesting the teleconference details. NVARC thanks Medtronic, Inc for providing the teleconferencing services under their employee volunteer support program for non-profit organizations.

Contact us on the N1MNX repeater.
442.900 (+), 100Hz
147.345 (+), 100 Hz
53.890 (–), 100Hz

This newsletter is published monthly. Submissions, corrections and inquiries should be directed to the newsletter editor:
editor@n1nc.org.
Articles and graphics in most PC-compatible formats are OK.

Editor: George Kavanagh, KB1HFT

This page was un-intentionally left blank.

Share your stories, successes, failures, learnings, quips, tricks, tips, and tidbits here in Signal.

They’d fit here nicely.

eMail to: editor@n1nc.org!

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