



# SIGNAL

A club since 1992



Since 1993



Since 1996

de N1NC

January 2019

Volume 28 Number 1

## This Month's Meeting

WRTC, the World Radiosport Team championship. Remember NVARC's role in WRTC 2014? Well, WRTC 2018 was held this past summer in Germany. For this month's meeting, Dennis Egan, W1UE, will visit and tell us about his visit to the most recent WRTC event—and perhaps regale us with a travelogue of his subsequent radio-related travels throughout Europe. Dennis has spoken to NVARC before, so we know this month's talk will be both entertaining and informative.

Because we switched things around to allow Dennis to speak in January, the February meeting will be Members Short Subjects. This is another of the "your meeting" meetings. Contact a Board member if you intend to present.

## NOTICE, NOTICE, NOTICE

**As of the February issue of Signal, all distribution will be electronic. If you absolutely need a printed copy, you can actively "opt in" by contacting Ralph, KD1SM. Per discussion at the January Board meeting, because of this late notice there will be no "up-charge" for newsletter mailings at least until the renewal date of your dues.**

## Last Month's Meeting

You never know what (or whether) folks will bring in for Home Brew Night. Last month produced eleven talks from nineteen attendees. That's enthusiasm!



Jim, AB1WQ, has produced a 3D-printed CW paddle and showed it with an Arduino-based keyer. Bruce, K1BG, brought in a "Mortty" CW & RTTY keyer.



Stan, KD1LE, showed a "hints and kinks" folding 440 yagi, as well as a 12v in-vehicle battery float/charger

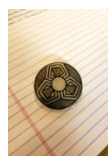


using 12v dome lamps for current limiting. He also noted the NVARC Arduino Group's

antenna analyzer that was web-published to include Group member modifications to the original QST design. Dennis, K1LGQ, showed us a battery



voltage display, as well as a battery pack with voltage display built-in. George, KB1HFT, has been casting silver and showed a beautiful brooch.



Charlie, AB1ZN, brought in a portable battery power supply with voltage meter. Mary, N1RKO, showed off the new collapsible portable 20/17/15 whip antenna she got for hilltopping with her KX2.



Les, N1SV, described getting on the new 630m band. See Les' accompanying article in this month's Signal. Rod, WA1TAC constructed a buck voltage inverter to use a 5v USB portable battery as 12v source.



(All photos by KD1SM)

## The President's Corner

At the December Board meeting, we discussed club expenses and dues. This was triggered by the January postal increases, which affect newsletter mailings. Club dues haven't changed since the club was formed in 1992. While we have had the good fortune to have had the very generous donation from FoxFinder Industries of some \$5000, several proceeds from estates, donations from the Squannacook River Runners (the Groton Road Race sponsors), free newsletter printing by several members, as well as donations for various Field Day costs, the treasury has been on a downward slope since the FoxFinder Industries donation.

We discussed the issue at the December general meeting to get more input. There was further discussion at the January Board meeting where we considered whether for any club activity—be it newsletter, Field Day, *etc.*—we should assess separate charges and how they would be tracked and collected. We decided to table the issue pending a Treasurer's report analyzing long term spending trends.

The analysis should also consider printing costs. While this is not an immediate issue, it may be one in the future when free printing is not available. I priced color printing of the quantity of copies we need and the price I received was \$2.10 per printed copy of each *Signal* issue. This means a \$15 dollar dues-paying member's printed/mailed newsletter would have an annual cost to the club of \$32.20. This would obviously be unsustainable.

If you are currently receiving a printed newsletter and would like to change to electronic, contact Ralph, KD1SM. We are also going to base newsletter mailing on a positive affirmation to the Treasurer. See the note elsewhere in this issue of *Signal*.

As a side note, we need a new *Signal* Editor starting after the April meeting. ~~Contact Skip, K1NKR, if you are interested. [Strikethrough inserted by the editor.]~~ Sooner will mean a smoother transition. ~~[Later likely means no newsletter. Unless, of course, Stan goes back to doing everything in the club by himself. Ed]~~

de Stan KD1LE

## Editor's Note

To follow up on Stan's solicitation, let me say that editing the newsletter for the past couple of years has been rewarding. Plus, it's a way of

contributing to the club while getting a bit of an "insider's view" of what's going on in what the Section Manager considers one of his successful clubs. (Note: I'm a more than occasional "observer" at Board meetings at my own initiative, sometimes a contributor to the conversation but never a decisionmaker.)

The editor's job is not difficult or time consuming. We've got templates and instruction documents. A couple of hours on MSWord once a month and you're all done. Preparing the newsletter can be done despite ragchewing, DXing, contest operating, experimenting, work or family schedules, school, vacations, socializing, dating, eye surgery, and even moving QTH. I can vouch for all of those firsthand.

The only challenge is content. Without contributions from members, it's easy for the newsletter to be just words from the president and editor, plus month-to-month standard stuff. Whether it's from misplaced modesty or something else, finding people who will step up with input can be a challenge. Bruce, K1BG, once cornered me and said, "Few folks will volunteer, but many will say 'yes' if you just make a direct request." Great advice; I wish I had followed it more often.



rest has been fun.

I won't be looking around for a volunteer replacement editor—it's the club leadership's job to solicit one. Finding my replacement isn't in my job description. But the

de Skip, K1NKR

## Adapting a 160m Inverted-L Antenna for 630m

By Les Peters, N1SV

(All photos and artwork by the author)



In 2017 the FCC opened up the 630m and 2200m bands for Amateur Radio use with some minor conditions as explained in this ARRL article <http://www.arrl.org/news/new-bands-fcc-issues-amateur-radio-service-rules-for-630-meters-and-2-200-meters>. During the winter of 2017 I started listening to 630m WSPR activity with my Elecraft K3S and K9AY loop and found it interesting to hear stations a lot farther away than I had originally expected. So in 2018 I decided to investigate how to load my 160m inverted-L up on 630m so that I could do more than just listen. The following is the general process that I used with links to different webpages that were helpful. It's by no means a step by step procedure but serves to collect information from different sources into one location for others to use in case they would like to follow the same path. One of the best resources to get started on 630m is the [www.472khz.org](http://www.472khz.org) website.

### Analyzing your antenna

On the [www.472khz.org](http://www.472khz.org) website there is a useful antenna simulation tool for estimating among other things the required value of the loading coil that you'll need <http://www.472khz.org/pages/tools/antenna-simulator.php>. To use this tool choose the type of antenna, enter its dimensions, and what you think the ground losses might be and then press the GO! Button. Hopefully the result is something similar to what you see in Figure-1 for my antenna. My ground losses are probably somewhere between average and very high so I choose very high. But if I actually knew what the losses were I could have entered it in the tool.

Antenna type = Lazy-L-antenna with a single topload wire	
Antenna dimensions	Antenna height = 16.764 m Topload length = 50.292 m
Antenna capacitance = 427 pF	
Required loading coil = 263 $\mu$ H	
Radiation resistance = 0.810 $\Omega$	
Loading coil loss = 3.1 $\Omega$ (for Q = 250)	
Ground / environmental loss = 50 $\Omega$ (estimated)	
Antenna directivity = 2.2 dBi (estimated)	
Estimated antenna current needed for	1 W EIRP = 0.673 A (antenna voltage = 0.53 kV) 1 W ERP = 0.861 A (antenna voltage = 0.87 kV) 5 W EIRP = 1.505 A (antenna voltage = 2.64 kV)
Estimated TX power needed for	1 W EIRP = 24.4 W 1 W ERP = 40.1 W 5 W EIRP = 122.2 W

Figure 1. Results for my 160m antenna

### Designing & Building the Variometer

A Variometer is basically two inductors connected in series where one is placed inside the other. The Inner coil is rotated to either add or subtract inductance so that the mutual inductance can be varied above or below that of the outer coil. The outer coil typically has taps so that large adjustments in inductance can be made by changing the particular tap and smaller

adjustments (values between the taps) can be made by rotating the inner coil.

WG2XKA has a great webpage <https://wg2xka.wordpress.com/the-variometer/> with a lot of useful info on how to make a bucket Variometer from items found in your local hardware store. On the [www.472khz.org](http://www.472khz.org) page there is also this helpful coil calculator <http://www.472khz.org/pages/tools/coil-calculators/cylindrical-coil.php>. I ended up using this info as a starting point and then varying it slightly as needed.



Figure 2. Bucket Variometer

### Things I learned in making a Variometer that you may find useful

- (1) When designing the inner coil use as large an OD for the PVC as possible while still being able to rotate it to ensure the largest amount of inductance, Ideally 25 - 30 uh.
- (2) Build the inner coil first and use the final measured inductance value to determine where the taps need to be placed on the outer coil so that there are no gaps in coverage.
- (3) Always design the range of the outer coil and its taps to extend well above and below the required loading value. In my case the estimated loading coil value was 257 uh and in the end I only needed 224 uh (13% less than the simulation indicated) but it's always better to have too much than to little range!
- (4) When cutting the hole in the bucket for the inner coil shaft make sure the shaft is a snug fit so the shaft isn't apt to change position once properly adjusted.
- (5) Duct tape is your friend while winding the coils and a hot glue gun is great when you're done to help anchor everything down.

***Les' article will continue in subsequent issues of Signal this Winter.***



## Strays

**Winter Fest 2019.** Information via Chris Babbitt, N1CFB.

Good Morning Radio Fans, The First-Best HamFest of the year is right around the corner. The Whitman ARC WinterFest 2019 will be held on January 19th 2019 from 9am to 1pm at the KofC Hall, 1195 Bedford St. (Rt. 18) in Whitman, MA 02382.

Entry is \$5 (with raffle prizes drawn at noon) and tables are still available. Visit <http://www.wa1npo.org/WF/2019Winterfest.htm> for event information and table payment options

The Algonquin Amateur Radio Club Flea Market will be held on February 16th, 2019 at the 1<sup>st</sup> Lt. Charles W. Whitcomb Middle School, 25 Union Ave, Marlboro. See <https://www.gsl.net/n1em/>

NVARC elections are coming up in April. Start running!

Most of us read QSTs when we receive them and then may flip through them a few months later before "archiving" them. *[My archive goes back to volume 1, issue 1. And no, they're not all original with my membership! For me, collecting QSTs and Handbooks is a sub-hobby. Ed]* At some point most peoples' old QSTs end up in the recycle bin at the transfer station. We've come to use the online version at ARRL-dot-org to search for information; That's easier than looking through years of indexes.

One way to promote Amateur Radio is to "recycle" your QST magazines to somewhere they will be available for the public to read. Suggestions might be your local library, town Senior Center, doctor's office, etc. Some places may have a periodical rack or table. Recently Stan, KD1LE, took one year of QSTs to Pepperell's Lawrence Library, which has a basket in the lobby where periodicals are swapped. The library in your town may do the same.

FYI department. Norway is well on its way to its goal of all new cars being emissions-free by 2025. Electric cars made up 31% of all new car sales in 2018. This does not include hybrids or plug-in hybrids, which are about 20% of sales.

## New Year's Resolutions

*Signal is on a subscriber list provided by author and blogger Dan Romanchick. His entry this month was particularly relevant to the new year.*

### **Make ham radio a habit**

By Dan Romanchik, KB6NU

Every week, I get an email newsletter from Penguin Random House called Signature. Signature includes links to articles about books and writing. Being a writer, I clicked on the link to "5 Good Writing Habits You Need to Learn Now." As I was reading the article, it occurred to me that the advice could also apply to amateur radio.

So, with apologies to the author, Lorraine Berry, here are five things you can do to make ham radio a habit:

1. **To get on the air more, or to do more building, set up a time to do it.** If you enjoy getting on the air or homebrewing, but never seem to be able to find the time to do it, you need to put it on your schedule. Set aside the time a couple of days, or a week, or even a month in advance, and you'll be more likely to do it. If you set up a regular time every week, pretty soon it will be a habit.
2. **If ham radio is important to you, create an environment that encourages you to do ham radio.** To make ham radio a habit, you really need a place that's set up to do ham radio. If you have to dig out and set up your equipment every time that you want to get on the air, you're just not going to do it. You need a "shack" that makes it easier for you to engage in the hobby. Richards, K8JHR, gave me some great advice back in 2012 on where and how to set up a shack (<https://www.kb6nu.com/building-a-new-shack/>).
3. **Create temptations that reward you for your new habit of ham radio.** For me, being able to make interesting contacts, or building some new gizmo, is reward enough, but you may want to reward yourself with a beer or some ice cream after an operating session.
4. **Make it easy to do what you like to do.** This is related to #4 *[actually, #3 Ed]*. Your shack should have everything you need to easily do whatever ham radio activities you enjoy doing.

If you enjoy operating, then it should have a nice operating desk. If you enjoy building, then set it up so that all of your tools are readily accessible. The easier it is to do, the more likely it is that you'll do it. If you enjoy operating portable, then build up a kit that has all the stuff you need, and have it ready to go when you're ready to go.

**5. Start with the Two-Minute Rule for new habits and continue from there.** The "two minute rule" (<https://www.lifehack.org/articles/productivity/how-stop-procrastinating-and-stick-good-habits-using-the-2-minute-rule.html>) is a tool to help you overcome procrastination. The idea is to allot just two minutes to a task that you'd like to complete or a skill that you'd like to develop. It's a small commitment, but enough to get you started, and the idea is that once you're started on a particular task or project, continuing work on that task or project becomes a lot easier. Those two minutes could easily become a half hour or an hour once you've gotten the ball rolling.

Armed with this advice, I'm expecting you to be a more active ham in 2019. I'll be listening for you on 40m.

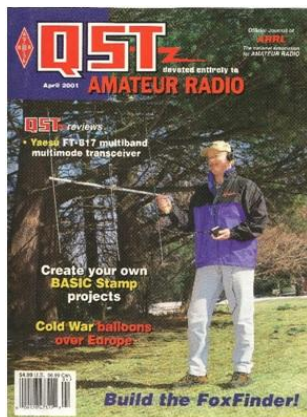
*Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (<https://www.kb6nu.com/study-guides/>), and one of the hosts of the No Nonsense Amateur Radio Podcast (<http://www.NoNonsenseAmateurRadio.Com>). His wife sometimes thinks that amateur radio has become too much of a habit for him.*

## Fox Finder What?

Once upon a time, NVARC members developed a tool for fox hunting called the FoxFinder (<https://www.n1nc.org/FoxFinder/>). It was featured in the April 2001 issue of QST.

NVARC still receives requests for the kit we created and had a query for multiple units as recently as this past December.

Not to be outdone by our own success, in 2005 NVARC members designed a set of bandpass filters intended to minimize interference from nearby transmitters such as those in a Field Day set-up. The construction documents were too large for a periodi-



cal to publish so we published them on our website (<https://www.n1nc.org/Filters/>). There have been many references to them by clubs far and wide, including an article circulated among members of the YCCC (Yankee Clipper Contest Club). The November 2018 issue of CQ magazine (page 70) has an article about what we called our "ugly filters."

## Treasurer's Report

Income for December was \$45 from membership renewals. Expenses were \$50 for future newsletter postage. This left a net expense for the month of \$5.

Current balances:

General fund	\$2,776.93
Community fund	\$5,061.52

As of 3 January, we have 51 members who are current with their dues and 14 renewals outstanding. Thank you to those of you who hand in your dues before I come to you. Please check your renewal status on the roster circulated at the monthly meeting or ask me.

If you are joining ARRL or renewing your membership please consider me letting me 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. I deduct the Club commission before forwarding your paperwork to Newington. As a Special Service Club, the ARRL expects a majority of Club members to also be ARRL members.

de Ralph KD1SM

## Board Meeting Notes

Board meeting 1/3/19

Attending: Stan KD1LE, Jim N8VIM, John KK1X, Ralph KD1SM, Ed N1YFK, Jim AB1WQ, Bruce K1BG. Observing: Skip K1NKR.

- \$250 donation received from Squannacook River Runners.
- Townsend Lions Club has requested our support for the River Race.
- GRR April 28, 2019.
- Thinking Day 9 & 16 February 2019.
- Discussion of newsletter publishing—do we still need to? [Prompted by discussion of postal rate increase. Ed] Or, dues increase. As expenses have increased over the years, dues have not increased [since 1992. Ed]. Postage, Field Day and other expenses have gone up. Ralph proposed that he perform a budget analysis for the next

Board meeting and the discussion be revisited after the analysis.

- Nevertheless, the January 2019 newsletter will be the last last one mailed unless a member specifically “opts in.”
- January meeting W1UE on WRTC Germany.
- Deb Pierce of Bromfield School to meet with Bruce regarding science fair ephemera.
- Skip to contact Jill re TDOTA.
- Stan and JimW making keys for scout troops.
- Stan has found LED lights for the Community Center that might work. (It could be a Community Fund expenditure.)

Respectfully submitted,

de John KK1X

## Club Services

### Elmering

Remember that NVARC has a multitude of members with experience in virtually all aspects of the hobby. Digital modes, circuits, antennas, Arduino and programming, QRP, LF/MF, VHF/UHF/SHF, contests and DX. And on, and on. Just ask.

### Field Day

This is the club’s premier operating event. Traditionally held on the next-to-last inclement weekend in June, FD is a little bit contest, a little bit EMCOM practice, a little bit publicity, a little bit socializing—and a great way to conclude the program year.

### ARRL Renewals

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; Ralph deducts the Club commission before forwarding your paperwork to Newington.

## Calendar

### January

19 WinterFest, 9a-1pm, Whitman MA

### February

9 NVARC’s support of a local Thinking Day On The Air (Tyngsboro)

16 NVARC’s support of International Thinking Day On The Air (Shirley)

16 Marlboro Flea Market

24 Augusta ME HamFest

### March

3 RADIO 50 Antique Flea Market, Nashua NH

## Upcoming Operating Activities

### 2019

Canadian NPOTA (all year!)

### January

1 Straight Key Night

5 Kids Day <http://www.arrl.org/kids-day>

5-6 RTTY Roundup

19-21 VHF Contest

26 [Winter Field Day](#)

### February

11-15 School Club Roundup

16-17 Thinking Day On The Air (International)

16-17 International DX Contest (CW)

### March

2-3 International DX Contest (phone)

Are you a “contest nut?” See <http://www.arrl.org/contest-calendar> (Contest Corral) for month-by-month listings of both ARRL and non-ARRL contests.

## Advertisers

Yes, we can accommodate advertisers.

## Canadian National Parks on the Air

### From the ARRL Letter

The Canadian National Parks on the Air event (CNPOTA) will get under way on January 1, 2019, and continue until year’s end. A volunteer group of a half-dozen hams in Nova Scotia, working with a zero budget, came up with the notion of attempting to replicate the success of the National Parks on the Air (NPOTA) event in 2016, first created to mark the centennial of the National Park Service.

Radio Amateurs of Canada (RAC) has announced its support for CNPOTA, in cooperation with Parks Canada. All radio amateurs are invited to activate any of Park Canada’s 48 national parks and 171 national historic sites, while “chasers” attempt to land a contact.

Activity for activators and chasers will be tracked on a dedicated website and a real-time leader board, and operators may compete for online awards and certificates. For updates on

the program's progress, [visit](#) the CNPOTA website.

*All this space (and more) could be yours!*



**Nashoba Valley  
Amateur Radio Club**

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<http://www.n1nc.org/>

**President:** Stan Pozerski, KD1LE

**Vice President:** Jim Hein, N8VIM

**Secretary:** John Griswold, KK1X

**Treasurer:** Ralph Swick, KD1SM

**Board Members:**

Jim Wilber, AB1WQ, 2016-2019

Ed Snapp, N1YFK, 2017-2020

Bruce Blain, K1BG, 2018-2021

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.

Meetings are held on the 3rd Thursday of the  
month at 7:30 p.m. in the Pepperell Community  
Center.

Contact us on the N1MNX repeater.

442.900 (+), 100Hz

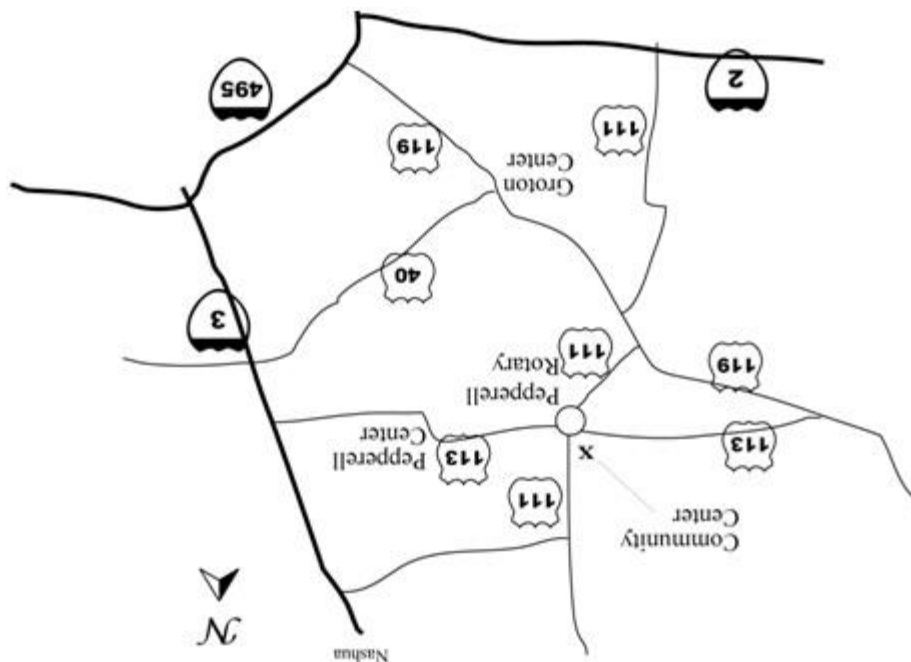
147.345 (+), 100 Hz

53.890 (-), 100Hz

This newsletter is published monthly. Submis-  
sions, corrections and inquiries should be di-  
rected to the newsletter editor. Articles and  
graphics in most PC-compatible formats are OK.

Editor: Skip Youngberg, K1NKR

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