



# SIGNAL

A club since 1992



Since 1993



Since 1996

de N1NC

May 2021

Volume 30 Number 5

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## NVARC Monthly Meetings

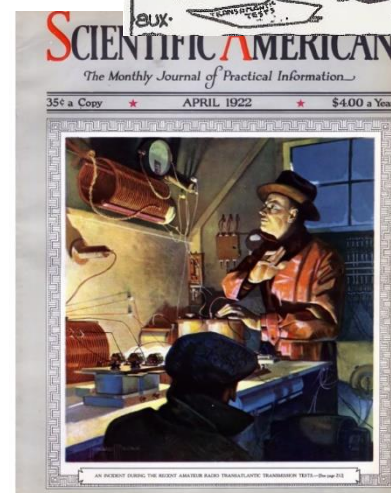
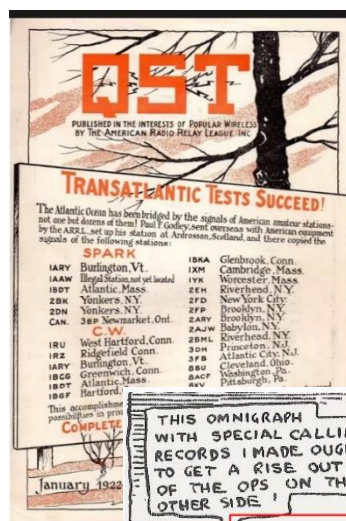
NVARC general meetings are scheduled for the third Thursday of the month at 2430 UTC (7:30pm, Eastern Time).

Non-members who are interested in attending may send an email to [meetings@n1nc.org](mailto: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.

## Last Month's Meeting

Frank, W3LPL, spoke on the Centennial of the 1921 Transatlantic Tests. It was an engaging talk that highlighted the impetus provided by amateurs in the development of radio communications. Here are some of Frank's slides:



## This Month's Meeting

We're pleased to announce that the May NVARC meeting will feature Carl Luetzelschwab K9LA, speaking on the topic "Cycle 25 Update and Understanding Space Weather".

NVARC is very fortunate to have K9LA, who is in demand nationally and is a regular at Dayton Hamvention's forum talks. He also made presentations in 2021 both at K3LR's Virtual Contest University and 4Z1UG's QSO Today Virtual Expo.

**Summary:** Carl K9LA will discuss the predictions for and the progress of Solar Cycle 25, including what to expect in terms of propagation throughout 2021 and as Cycle 25 ascends.

He will also review simple antennas for 15m, 12m and 10m as Cycle 25 ramps up.

He will then briefly review websites with space weather data and how to tie this important data to HF propagation conditions.

Finally, he will highlight real-time propagation websites that allow us to assess what's happening right now.

**Biography:** Carl Luetzelschwab, K9LA, started his radio career as a short wave listener in the late 1950s. He received his Novice license (WN9AVT) in October 1961, and selected K9LA in 1977.

Carl is a graduate of Purdue University and was an RF design engineer until his retirement in 2013.

Carl enjoys propagation, DXing (he's at the Top of the Honor Roll), contesting (he was NCJ Editor from 2002-2007), experimenting with antennas and restoring/using vintage equipment.

He and his wife Vicky, AE9YL, enjoy traveling, which has included DXpeditions to Syria (YK9A in 2001), to Market Reef (OJ0/AE9YL and OJ0/K9LA in 2002) and numerous trips to ZF (Vicky is ZF2YL and Carl is ZF2LA). Carl is currently the ARRL Central Division Vice Director.

He has received the Bill Orr W6SAI Technical Writing Award, the YASME Foundation Excellence Award and the Indiana Radio Club Council Technical Excellence Award.

Carl maintains an extensive website at <https://k9la.us> with selected articles and presentations about propagation and solar topics, grouped into categories - Monthly Feature, Timely Topics, Basic Concepts, Tutorials, General, 160m, HF, VHF and Contesting. It's well worth your time.

-de Phil, W1PJE

## The President's Corner

de Bruce, K1BG

It's been an interesting year to say the least. If I were to write a movie about the last year, I'd take some liberties with one of my all-time favorite science fiction movies and call it "The Year the Earth Stood Still". Not that the earth – or any of us – *really* stood still.

Homo sapiens is an interesting species – when faced with challenges, we adapt, we improvise, we innovate.

For NVARC, it means we had to do things differently. NVARC was an early adopter of virtual meetings, thanks to Jim N8VIM and his employer, Medtronic, who generously allowed us to use their GoToMeeting and Zoom accounts.

NVARC held a socially distant Field Day and picnic in 2020, with particular attention paid to the safety and well-being of all attendees.

Saturday morning breakfasts also moved online, and while a small weekly group is now meeting at Tiny's, Zoom breakfast continues to be popular.

And finally, there has been renewed interest in the weekly Monday night 2meter net. Thank you to all the volunteers and participants who make these activities so successful. Hopefully, all this activity will translate into increased activity when things get "back to normal". I, for one, am looking forward to it.

Two important things took place at the April 2020 NVARC meeting. First, it was the first club meeting held on-line, which was a new experience, and it proved to be successful. Second, we held our annual elections at this meeting.

I want to personally thank the outgoing officers and directors who stepped up during those difficult days and who led NVARC during this challenging year: President – Jessica, WU3C, Vice President – Jim, N8VIM, Secretary – John,

KK1X, Treasurer – Ralph, KD1SM, and board members Jim AB1WQ and Skip, K1NKR.

Please also join me in welcoming our new officers and board members. Myself, K1BG as president, Vice President – Phil, W1PJE, Secretary – John, K1JEB, returning Treasurer – Ralph, KD1SM, and board members Jim, AB1WQ, Skip, K1NKR, and Jim, N8VIM.

I hope to see all of you at the meeting on Thursday May 20<sup>th</sup>.

-de Bruce,  
K1BG

## Monday 2m NVARC Information Net

The NVARC Information Net, is held Monday nights at 7:30pm, Eastern time on the 2m Pepperell repeater, N1MNX: 147.345MHz, PL: +100. Recent activity has been steady, with a dozen or so checkins.

NCS duties have been on an informal rotating basis, as Charlie, AB1ZN, is out of town for a while. Jim, AB1WQ, was NCS on Monday, April 5, Bill K1NS did duty on May 3rd.

## Restoring a Central Electronics 20A SSB Phasing Exciter – Part 3

de Bill, AB1XB

After gaining courage by hearing the 9 MHz local oscillator signal, reported in the last article<sup>1</sup>, I proceeded to set up the Central Electronics 20A for alignment.



### RF Alignment

A phasing SSB exciter, as described in Part 1 of this series<sup>2</sup>, has to develop two RF signals that are 90° out of phase (i. e., “in quadrature”).

In the 20A, this is done by feeding the 9 MHz local (master) oscillator output into two tank cir-

cuits with slug-tuned coils, that are resonant at 9 MHz, and inductively coupled.

The distance between the coils and adjustment of their slugs changes the phase angle and strength of the two output signals. See the left side of Figure 1.

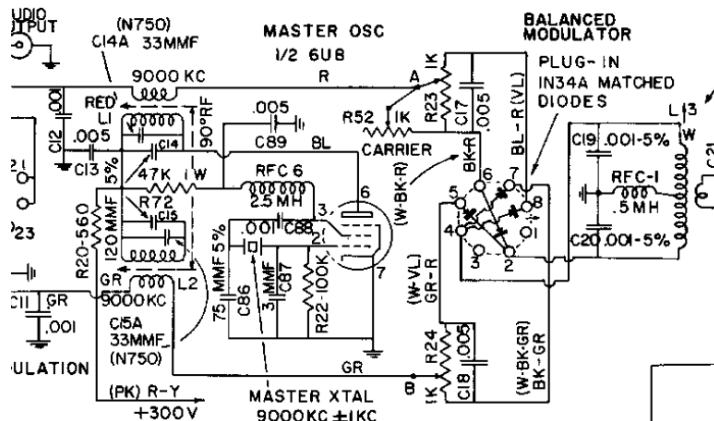


Figure 1. Local oscillator with RF phase shift and balanced modulator circuits.

These two inductors, L1 and L2, are actually transformers with secondary windings through which the two already-90-degree-phase-shifted audio frequency (AF) signals are passed. I'll cover the AF section in a bit.

After passing through the L1 and L2 secondaries, the AF components are now 180° out of phase.

The resulting pair of mixed signals now pass through three potentiometers, R23, R24 and R52, that vary their relative strengths, to either cancel or pass along the carrier.

Then the signals proceed to a pair of balanced modulators, which consists of four matched diodes.

This produces the nonlinear mixing that results in three signals – the carrier and two sidebands, as described in Part 1 of this article series.

The first job in aligning the 20A RF is to get the two RF signals into quadrature, with no AF input.

The 20A manual from 1954 says to do this by adjusting the tank circuit coils' distance apart and slug insertion so their secondary voltages are equal and 5-6 volts RF peak. Of course, today, with affordable oscilloscopes available, we can do this accurately by tuning for a circle on an XY scope plot. I used both methods.

<sup>1</sup> <http://n1nc.org/Newsletters/2021/3004.pdf>

<sup>2</sup> <http://n1nc.org/Newsletters/2021/3002.pdf>



In my first attempt, I read 3.7 volts RF on the L1 secondary and 0.9 V on the L2 secondary (see Figure 1).

Trying to tune the L1 slug, I discovered that it was frozen. The L2 slug was fine, but adjusting it, as well as the coil spacing, achieved only a 1.2 V peak for both coils with a phase shift of less than 50°. Both L1 windings had continuity and no shorts, and caps were good.

Several of the slug-tuned coils in the 20A had been painted with something like Glyptal<sup>3</sup> or Loctite<sup>4</sup> to lock the slugs in place. Researching this, I found several solvents that could dissolve these compounds, but to make a long story short, none of them worked. As a last resort, I tried Liquid Wrench<sup>5</sup>, which worked for some of the coils but not L1.

My assumption was that the iron core inside L1 had actually rusted to the point that rust had invaded the tuning threads.

Bob, W1XP, suggested that, as a test, I try to resonate the L1 tank at 9 MHz by changing its capacitor value C14-C14A.

Based on where it was resonating then, I calculated that I needed to lower the capacitance from 153 pF to 133 pF. After doing this, the resonant frequency was now 9.015 MHz, measured using the nanoVNA – very close to target.

Back in circuit, though, the voltage improved by only 9.7%. Based on the measured Q, the 9.015 MHz circuit resonance was well within the -3 dB shoulders of  $\pm 0.090$  MHz from the crystal frequency.

After this test, I began to wonder if the problem was elsewhere in the oscillator circuit.

Around this time I asked Nick Tusa, K5EF, who has rebuilt many CE rigs, if he had any L1 and L3 coils.

Nick was very quick in yanking both coils out of a spare 20A and sending them to me for free! So, this was my ultimate fallback if I didn't find any problems in the oscillator circuit.

To resolve this question, I decided to build the oscillator and tank circuits entirely outside the 20A, using new parts. Then I would substitute the old parts into the "in vitro" circuit until I found

the problem. A coarse-level approach, but good for diagnosing a problem when you don't know any better.

I built the external circuit, with the new L1 coil from Nick, expecting it to work, and it did. Varying the L1 and L2 slugs and spacing on the external board, I achieved a very satisfactory 6.0 volts RF peak on both secondaries, and a perfect 90° phase shift (see scope trace in Figure 2).



Figure 2. External 9 MHz oscillator and 90-degree RF phase shift display.

Now, the goal was to find out what part was bad in the in-circuit oscillator. The first thing I wanted to know, though, was how the old L1 coil behaved in the new circuit. Substituting it for the new coil, it showed the previous behavior – low voltages in both coils. So, without any other substitutions, I realized that L1 was indeed the culprit. I did not have time to pursue why, since in any case the coil needs to be tunable.

Since the original oscillator wiring was such a mess in the 20A, I decided to rewire all of it with new resistors and mica caps from the test circuit, leaving the original temperature-compensated precision caps connected to the crystal since I knew they were good.

With the new coil and circuit, I fired up the 20A; there was no smoke, carrier-null pots worked, oscillator output was good and RF alignment was completed. I tuned up on 80m and saw 14 Watts CW output from the finals. Pretty good for a 20 W exciter that is 67 years old!

### AF Alignment

Turning to audio frequency alignment, the goal for the 20A is to produce two undistorted AF signals that are in 90° quadrature in the frequency

<sup>3</sup> <http://glyptal.com/>

<sup>4</sup> <https://www.loctiteproducts.com/en.html>

<sup>5</sup> <https://www.liquidwrench.com/>

range 300-2500 Hz. The circuit fragment is shown in Figure 3.

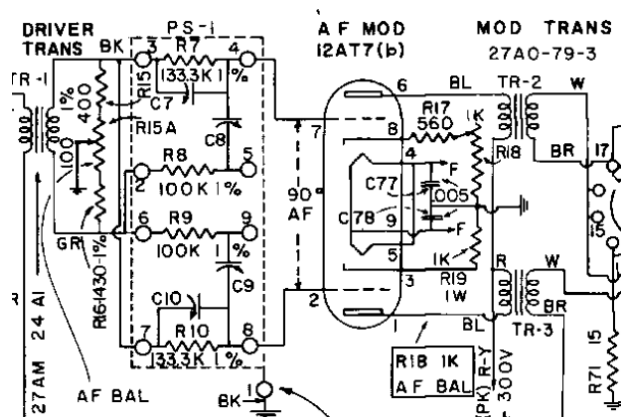


Figure 3. Audio frequency phase shift stage

After the microphone or other audio input passes through preamplifier and AF driver stages, it enters an AF phase shift network, PS-1 inside the dotted lines in Figure 3.

This produces two AF signals that are phase shifted by 90°. The signals are amplified again by a 12AT7 dual-triode and fed into twin impedance transformers, the ones mentioned in Part 2 that are Radio Shack replacements. From there, the AF signals pass through a sideband selection switch and then on to the RF local oscillator and mixing stages described above.

At entrance to the PS-1 network, and at the cathode of one of the 12AT7 triodes, are two audio balance potentiometers. R15A is adjusted to keep the signal pair at the correct amplitude ratio of 2:7 going into the PS-1, and R18 is adjusted to equalize the amplitudes coming out of the 12AT7. This balancing is critical for getting low distortion and unwanted sideband suppression.

The 20A manual outlines how to align the AF stages using a combination of the AF balance pots, carrier null pots, L1/L2 fine-tuning, and successive transformer tuning before the VFO mixer stage. The manual has hand drawings of what "good" and "bad" SSB modulation would look like on a scope.

After following this alignment procedure, my output looked like the "bad" drawings. So, I decided to look at the output of the phase shift network, PS-1, in XY mode.

It was pretty close to a circle at 300 Hz. But as frequency increased, it became more elliptical

and slanted. So, I knew the 90° phase shift was getting worse at higher frequencies.

Now the manual says the PS-1 module is factory calibrated "for life," and not to muck with it. But obviously mine must be beyond its life, so I opened it up and began looking for how to calibrate it.

Searching revealed that the PS-1 was identical to the one designed by Donald Norgaard, W2KUJ, for the 20A's precursor, the "SSB Jr.," published in Ham News, Dec. 1950, by GE Corporation. Same parts, even the same component labels. Luckily, Norgaard had written the calibration steps in exquisite detail, even down to how to set up the test environment.

So, I proceeded. I broke the surly bonds of Glyptal® on four trimmer capacitors, severed one lead on each of four precision resistors, set my signal generator to the first frequency, added a transformer and 2:7 ratio potentiometer, and attached probes.

Basically, the game after that is quite simple. You have to get a circle displayed on 4 frequencies using 4 trimmer capacitors. Each RC circuit produces a 90° phase shift at its own resonant frequency, isolated from the other circuits. The combined RC circuit network is designed to maintain a phase shift within 1.3° of 90° over the range 225-2750 Hz, provided the two input signals are in a voltage ratio of 2:7.

Results: Two of the RC circuits were spot-on correct. The third circuit showed a straight line at 45°. This trimmer, when turned, gave out a creaking sound and the scope trace disappeared.

However, after turning it some more, the trace came back and I adjusted it to a perfect circle.

The fourth circuit also had a little trouble but I got its trimmer to produce a circle as well. These are mica trimmers and I don't know if they are brittle, so out of caution this was as far as I went.

I re-soldered the leads and buttoned things up, but without painting the trimmers in place. Figure 4 shows the final result, with scope in time domain mode.

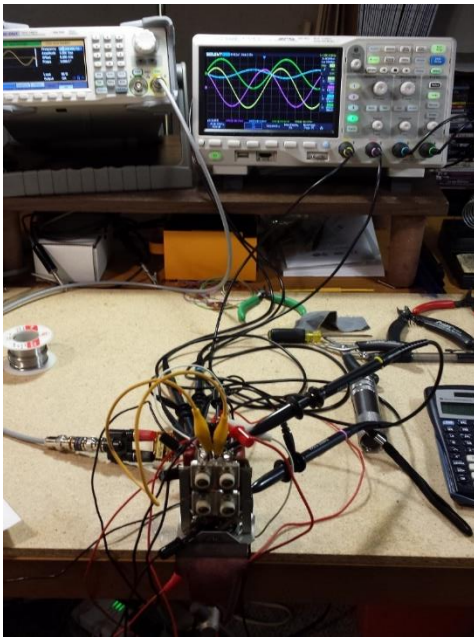


Figure 4. PS-1 audio phase shift network after re-calibration. Trimmer caps are in foreground. On the scope, blue and green traces are input, yellow and purple are output, phase-shifted by 90°.

Testing went well after this. AF phase shift was 90° pretty much through the desired range.

After attaching my receiver antenna to an RF sampler off the 20A dummy load, through a huge attenuator, I discovered that I could see my SSB signal using Fldigi<sup>6</sup>, which I use as a poor man's audio panadapter.

Fldigi has a mode called Spectrum Scope that has a vertical amplitude scale calibrated in dB and frequency horizontal scale up to 4 kHz wide. I could use this to measure sideband suppression and distortion.

So, the next task was to get the audio balance controls aligned by varying 4 pots and 3 coils while observing the oscilloscope and spectrum scope. This requires moving the alignment screwdriver 7 times for each adjustment, each time having to remove my glasses to find the screw slot, put it in place, put on glasses, look at scopes, turn screw, then move to next screw. Insane.

So, I realized this would go better with 7 screwdrivers. But how to make them stay in the screw slots?

Stan, KD1LE, came up with the perfect solution: put heat shrink over the screwdriver blades and over the screws, creating little sleeves. Heat-shrink them in place (or outside the cabinet, heat-shrink them over a screw the same size as

the adjustment screw). If you don't overheat them, they will come off easily, but stay firm enough to hold the screwdrivers vertical. See Figure 5.



Figure 5. Alignment screwdrivers held up by heat shrink sleeves.

Next, I discovered that the PS-1 input audio balance pot was at the end of its range when balanced, leaving no room for distortion adjustment (harmonic reduction). Having tested the pot earlier, I guessed that this was due to the 12AT7 modulator having unbalanced triodes.

George, KB1HFT, was kind enough to send me four 12AT7 tubes which he had characterized using his tube tester.

Inserting the one that had both the closest match between the twin triodes as well as the highest "quality" readings from George's tester solved the problem. Now the optimal adjustment was in the middle of the pot! I could squeeze out that last bit of distortion.

And finally, Bob, W1XP, suggested that I play a radio into the microphone and listen with the RF sampler.

I streamed a podcast and output the audio through an attenuator to the 20A microphone input, with output to dummy load, and listened to voice quality watching the spectrum scope and monitoring the opposite sideband. I got it tuned

<sup>6</sup> <https://en.wikipedia.org/wiki/Fldigi>



to -40 dB suppression, which was the 20A design spec. Quality sounded pretty good to me.

It was time for an on-air test. I'm using a signal generator for a VFO, so I set it to 5.175 MHz which, when injected to the 9 MHz oscillator, results in an output on 3.825. George and Stan joined me for a short QSO in which, apparently, I was intelligible, because we kept talking about how to listen for the unwanted sideband.

I've omitted a few things but this has gone on long enough, and I appreciate everyone who has read this far. My next steps are to restore the 458 VFO for the 20A; restore my old linear amplifier; build a T/R switch sequencer; and get my HQ-140-X receiver up and running again.

This has been a great learning experience for me and a lot of fun. The high quality of Central Electronics circuit design, component choices and physical integrity in the 20A make it easy to justify extensive restoration.

Thanks to all the hams who helped me solve problems, invented things, and took interest along the way. It was a Zoom-enabled, truly collaborative effort.



"Open the pod bay door, Hal."

-de Bill, AB1XB

### **NVARC participation in the New England QSO Party (NEQP)**

de Phil, W1PJE

On May 1 and 2, the 2021 edition of the New England QSO Party (NEQP) was held across the US and the world on non-WARC operating bands.

NEQP has been increasing in popularity since its modern inception in 2002. (There was indeed a much earlier version in the 1950s and 1960s - see <https://neqp.org/the-first-neqp/> for details including a first-hand report by die-hard contest-er Frank W3LPL, our April NVARC speaker.).

NEQP is more of an operating event – a chance for operators outside New England to focus on awards such as bands and states for Worked All States, county awards, and similar items. And it always provides a chance for New England stations to be in great demand, with ops from all over the world looking to contact them.

The NEQP is also one of the QSO Parties that is part of the QSO Party Challenge - more is available on that subject at <http://www.stateqsoparty.com/>.

Full information is maintained on NEQP at <https://neqp.org>.

Last year (2020), NVARC held the distinction of having the highest number of participants of any club in New England (with the exception of the Yankee Clipper Contest Club, which is not considered a local club). Our intrepid president Bruce, K1BG, encouraged NVARC to make a strong showing once again in 2021.

For 2021, we can report that once again we had several NVARC participants. K1BG led the way as usual in an all-CW effort with an extremely strong showing including 97 multipliers (!).

In fact, Ethan Miller K8GU, a friend of W1PJE, heard K1BG on 40 meters while mobile during the daytime from Ohio and reported an 'ear splitting' signal.

W1PJE also participated with 95% CW operation and 41 multipliers, surpassing his last attempt, and worked K1BG on multiple bands in the process. Others I know of that found time to be active include your newsletter editor, George, KB1HFT, (who also worked K1BG on CW [Ed: twice!]), Skip K1NKR, and Jim AB1WQ.

Finally, a reminder: in order for NVARC to get credit for your effort, those who haven't yet should make sure to submit your logs for the NEQP within 30 days of the event.

Logs should indicate times in UTC, bands, modes, calls and required contest exchange in Cabrillo format if submitted online. Paper logs may also be submitted<sup>7</sup>.

See K1BG's message of 25 April to the NVARC reflector for more details. And don't forget to put those contacts into Log of the World for credit!

-de Phil, W1PJE

### **Simple Remote Operation**

de Bruce, K1BG

"Remote" operating has become the rage in Amateur Radio, for many different reasons.

<sup>7</sup> <https://neqp.org/rules/>

Operators living in neighborhoods with homeowners associations, condos, apartments, etc. have little choice if antennas are prohibited.

Others set up so called “superstations” at locations with large towers and antennas that are impractical at their regular station locations.

And finally, there are those who just love the convenience that “remote” operation offers. The ability to sit on their back deck or in front of the fireplace with an iPad and operate their station in the basement suits them.

Whatever the reason, it seems like every day more and more people are operating remotely.

Companies like Elecraft and Flex offer expensive high-end solutions specifically for remote operation.

I’m more familiar with “poor man’s” solutions to the problem, which I believe are just as effective.

Generally, there are two problems that must be solved if you want to set up an inexpensive remote. First is rig control, and second is audio connections.

IF you have already interfaced your radio to a popular logging program where you have rig control, can display frequency, change modes, interface to the sound card (for digital modes or RTTY), etc, then you are 90% of the way there.

The trick is to continue using these rig control programs, but be able to access them remotely. “TeamViewer” is a program used to remotely access a computer in order to provide remote IT-support capability.

By taking remote control of a computer at the station location using TeamViewer, what is on your remote screen is exactly what is on the station monitor.

Another program that has become widely used recently is AnyDesk.

Both are easy to set up, and both are very intuitive. Both are supposed to be free for non-commercial applications, although I have heard that TeamViewer has been pressing users for subscriptions.

OK, so now that you can manipulate your rig remotely, how do you get audio?

One solution is to simply set up a Skype conference between yourself and the remote station.

After logging in with TeamViewer or AnyDesk, call the other computer from one of them using Skype and don’t bother to use the video connection.

Your rig is already connected to the software for digital modes, so when you talk on the remote side, it should go to your rig’s audio input.

Make sure your rig’s VOX is being enabled so that you can key the remote transceiver.

Another program for audio connection is Mumble. Mumble is free, and utilizes a low latency voice over IP server that was designed so that video gamers could communicate on private channels with each other. While Skype is easy to set up and use, Mumble requires that you either setup a server or find someone who will allow you to use theirs.

The software (and the server) are free. For voice and data modes (and CW when using the keyboard to send), this is all you need to do for remote operation.

If you have a station connected to a popular logging program, with soundcard connections that support popular digital modes, give it a try!

Install AnyDesk (or TeamViewer) on both computers and remotely access your shack computer from the “other computer”.

Install Skype on both computers and create a session where one is talking to the other (you may need two Skype accounts for this, but I’m not sure! I need to try this...). You will need to remotely start Skype on your shack computer.

Next month, I’ll talk about other things you might want to do. Interfacing paddles remotely, rotators remotely, and amplifiers remotely. And I’ll share some remote stories – contesting from a Denny’s parking lot, and operating superstation K1TTT in the ARRL DX CW contest – remotely.

Until next month, 73!

-de Bruce, K1BG

**From the Shack**  
de George, KB1HFT

I was recently made aware of the origins of one of my favorite parts vendors: Digi-Key. Thanks to Bill, AB1XB!

Digikey was founded in 1972 by a Ham, Ronald Stordahl, AE5E, as an outgrowth of his success-



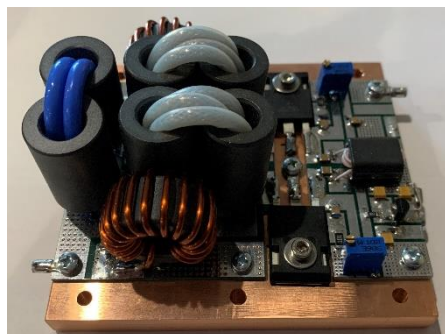
ful keyer kit: the “Digi-Key”, that he devised and marketed while at MIT. This from Wikipedia<sup>8, 9</sup>:

“**Digi-Key** is a privately held American company that distributes electronic components. Headquartered in Thief River Falls in the U.S. state of Minnesota, the company is the fourth largest electronic component distributor in North America and the fifth largest electronic component distributor in the world.



I went to Breakfast at Tiny's last Saturday. They have instituted COVID restrictions on capacity, and table spacing, but the service and food was as excellent as always. The six of us had a good face-to-face gab session.

For a cool Show-and-Tell, Dan, KW2T, brought a dual MRF300, 600W, class AB power amplifier:



Dan relates that the amp runs on 50 volts. It is mounted on a solid copper heatsink about 10cm x 10cm x 1cm. Hefty!

Dan got this and a 6m low pass filter via the web last February<sup>10, 11</sup>. The link in footnote 11, below, has a cool video of the amp in a test setup.

Hopefully, Dan will keep us apprised of its performance.

-de George, KB1HFT

### Board Meeting 6MAY2021

The board meeting came to order at 7:30pm on May 6, 2021.

- The treasurer's details report was mailed out by Ralph.
- A discussion on new members.
- The bank account signatures need to be transferred to the new offices.
- George will continue to distribute Signal to public via HRO and Electronics Plus, in Littleton.
- Phil will take control of the NVARC Facebook page.
- The 18650 Battery Challenge is still going on. Jessica is too busy to do any further managing of this event. There are currently 6 participants.
- Next August is the usual Picnic Event. Do we want make this happen? If so then volunteers are needed to plan this event.
- Bruce wanted to make the next QSL Card Sorting event to be able to sort 18 QSL Cards/ minute / Person X 24 people for a total of 28,000 Cards being sorted. Bruce introduced his USPS Direct Mail Box card sorting rack. The rack consists of 4 slots high and 7 slots wide with a total of 28 slots per rack. Very nifty idea.
- Ralph suggested moving the General Club Meeting location out of Pepperell Community Center. It currently is unused do to the COVID Pandemic. Jim Wilber and Bruce Blain will try to reach out to the Pepperell Town Clerk (Nancy) if there is any chance for using the Community Center Building.
- Bill Principe, K1NS, ran last Monday's 2-meter club net . Great work Bill! When the net began there were 4 to 5 participants. It now has increased to between 10 to 13 participants.
- The club's Saturday Breakfasts at Tiny's is back and last Saturday May 1<sup>st</sup> there were enough people to occupy 2 tables with 6 persons per table.
- Bruce is still conducting a class with 2 kids from Boxborough, MA
- The paddle Kit project is still on. Jim Hain is still looking for a Kit manager.
- 

<sup>8</sup> <https://en.wikipedia.org/wiki/Digi-Key>

<sup>9</sup> [https://en.wikipedia.org/wiki/Ronald\\_Stordahl](https://en.wikipedia.org/wiki/Ronald_Stordahl)

<sup>10</sup> <https://eb104.ru/karta-sayta/directory>

<sup>11</sup> <https://eb104.ru/internet-magazin-shirokopolosnye-usiliteli-moschnosti-pa1000w/hf-power-amplifier-ldmos-trasistor-1200w-output/hf-6m-power-amplifier-450w-mrf300-for-digital-mode-copper-pate>

## Field Day 2021:

- Big Question: Are we going for a ½ Field Day or the usual Full Field Day?
- ARRL has maintained the same COVID rules applied for 2020 FD will apply for this year.
- The club, if desired, could aggregate all the member scores.
- FD will be pushed as a major club activity. COVID precautions will as last year.
- Town of Pepperell will give two restrictions:
  1. No sharing of food.
  2. A log must be maintained on all who enter and leave the FD site.
- Several FD COVID safety scenarios were mentioned.
- Do we bring the generator? Do we bring the Tower? Pota Potty? Etc.



- There was a discussion concerning supporting the Boy Scout Merit Badge. There will be a camp out in Rutland, MA. The scout master is looking for a local ham club to help him with ham equipment and support for the merit badges in December 2021 time frame.
- Ralph mentioned something about BSA and Owen Salter KC1KZT with the ARRL youth program. (Not sure what that was about.)
- Bruce made a suggestion for extra activities like after a Saturday Breakfast doing a Shack Visit or bring back tech nights , or teaching new comers to Ham Radio some technical things that will help them get going in the hobby or start a 10-meter net for the new technician class operators on Thursday nights etc.
- Should the club make a budget plan report? Historically this was not done.
- A discussion on the possibility of any field trip activities.
- JohnB, K1JEB, suggested the club have a Club "Visioning" Session where members can mention all the possible club activities they can come up with. Then have a pro-

cess of voting on the activities that each club member feels is of value to them. (It is a bit more complicated to explain here. But may be valuable in helping the club to focus on activities that are of value to all concerned.)

-de John, K1JEB



Have **YOU** paid your NVARC Dues? See:  
<http://n1nc.org/Members/Roster>  
for your renewal month.

## Treasurer's Report

Income for April was \$140 in membership renewals. There were no expenses recorded for the month.

Current balances:

General fund	\$2,805.43
Community fund	\$5,948.25

Welcome to new members Vlad W1MTI, John W2BVU, John KC1OYG, and Bethany KC1OYH.

As of 6 May we have 41 members who are current with their dues and 31 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](http://www.n1nc.org) in the Member's area.

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

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. As a Special Service Club, the ARRL expects a majority of Club members to also be ARRL members. Contact Ralph for further information if you need it.

de Ralph, KD1SM



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**Nashoba Valley  
Amateur Radio Club**  
PO Box # 900  
Pepperell Mass 01463-0900  
<http://www.n1nc.org/>

**President:** Bruce Blane, K1BG  
**Vice President:** Phil Erickson, W1PJE  
**Secretary:** John Bielefeld, K1JEB  
**Treasurer:** Ralph Swick, KD1SM

### Board Members:

Bruce Blain, K1BG, 2018-2021  
Jim Wilber, AB1WQ, 2019-2022  
Skip Youngberg, K1NKR, 2020-2023  
Jim Hein, N8VIM 2021-2024

Property Master: John Griswold, KK1X  
Librarian: Peter Nordberg, N1ZRG  
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](mailto: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](mailto:editor@n1nc.org).

Articles and graphics in most PC-compatible formats are OK.

Editor: George Kavanagh, KB1HFT

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**Nashoba Valley Amateur Radio Club**

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