

 <p>www.arrl.org</p>		<p>St. Paul Radio Club</p> <h1>Ground Wave</h1> <p><i>Jeff Iverson, WB9DAN, Editor</i> <i>Dale Maroushek, NØPEY, Publisher</i></p>	<p>KØAGF www.stpaulradioclub.org Club Repeaters: 145.310 MHz, 442.450 MHz 114.8 kHz tone PO Box 9375 North St. Paul, MN 55109</p>
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NEWS AND NOTES FOR MARCH 2021 – Volume 81, Issue 3

NEXT (ON-LINE) MEETING: FRIDAY MARCH 5, 2021

6:00 PM Board Meeting (all are welcome to watch)

7:00 PM Fellowship and (your own) Refreshments

7:30 PM Short Business Meeting with Program Following

(Zoom details are at the end of the newsletter)

(Note: April Meeting will be April 9 because of the holiday)

Program

Our March program is not yet determined at press time. Join us for fine conversation in any event.

Elections

Nominations for Saint Paul Radio Club Secretary remain open:

Secretary: Keeps a record of the proceedings of the Club, including all regular and special meetings of the Board and Members, conducts the correspondence of the Club, and keeps a record of the same. The Secretary keeps the bylaws of the Club and makes them available to members upon request. The Secretary is a member of the Board of Directors.

SPRC Breakfast

Our traditional third-Saturday breakfast has had some interruptions in the last few years. First Perkins closed and we found a new physical location at Denny's, then the virus came along, and we lost that location. After a hiatus of several months, we resumed the SPRC breakfast via Zoom in February. It was a great success with 16 attending—more than we manage to lure to Denny's. The format was the same as the in-person breakfast—someone brings something up and, if it catches our interest, we talk about it. Most of the topics have nothing to do with ham radio. And, yes, some of us talked while eating breakfast. We'll continue this tradition on Zoom each third Saturday

until we're able to resume in person. Watch your email for the Zoom link (It's the same as last month).

Program Suggestions

An important part of our member meetings, be they on-line or in-person, is our programs. The board will meet to plan the whole year's programs during the next couple months and we would like your suggestions of what you would like to see in a program over the next year. If you would like to present a program, that's a great idea, too! Please send your suggestions, including potential presenters' contact information if appropriate, to dk@donkelly.biz (or WA6ZMT@arrl.net, if that's easier to remember).

From the President – Lou Michaels WD8NOV

Greeting all and here's hoping we all have a great March. Will she come in like a lamb or a lion?

March 14th is that night we have to stay up until 2 a.m. to turn the clocks ahead. That leads us to St. Patrick's Day on the 17th, but without the parade and festivities.

Then we usher Spring in on the 20th. Get ready to stand those eggs on end.

The 28th brings us to Palm Sunday and Passover. Everyone, please be safe and stay safe, wear a mask and keep watching for when and where a virus shot is available.

A What Kind of Hamfest?

Have you ever heard of or attended what was referred to as a "Progressive Dinner"? I don't know if folks do these anymore, but back in the 70's, it was a way to "share" the responsibility and courses of a dinner party. Alice offered appetizers on Aldrich Ave., then we all drove to Sue's for salad on South St. then moved to Elise's for the entree on Eleventh St., then over for dessert at Doris's on Day St., ending up for cocktails at Candy's on Cane Court. I can hear you now, just go to a restaurant!

So why not a Progressive Hamfest? Let's look into the operation of a traditional fest, and compare the pros and cons. I tried to get this going last year, but it got bogged down when the Liability Factor popped up. So, I'm treating it just like a yard or garage sale, which most homeowner's policies cover.

A Hamfest is a radio/computer/electronics gear sale that gets sellers and buyers together. Some have fees to sell and/or buy, and many have overhead bills. The seller has to plan/pack/load/drive/unload/display/sell/repack/reload/drive/unload/replace their stuff back at home. That is a lot of work. The buyers get up/drive/shop/pay/drive/unload and play with the new toys.

As I see it, the buyers have the best deal while the sellers are overworked. We start out as buyers until we have something to pass along, then we become sellers. I used to sell

often, but then the work factor came in, and I only sold or donated to the SPRC Auction. How do we fix that? The Progressive Hamfest.

Ray Johnson, WB0EBG, has set the stage with a follow up on his Yard sale last year. He lives a half mile south of me. I checked QRZ and there are many more Hams in this area from Oakdale to Roseville, Woodbury to White Bear. Ray has picked April 17th, 0800 for his sale. Let's say more of us join him by having a sale too. We advertise it to Hams in emails and on nets, and locations can be found on QRZ or by address on your phone mapping app.

Now the sellers only have to pull the stuff out, display it, sell it, put it back and count the money. The buyers still just drive around from place to place picking a route that they are happy with. This will be year one, we may only get 10 sellers, but that makes your trip over to Ray's 10 times better in my book.

So, who is out there willing to commit and join the planning and execution of this Ham Adventure? I'll be the Point of Contact and get this started.

Dale Maroushek, NOpey@arri.net

Dale's Details by Dale Maroushek NØPEY

Following up on last month's column, I did not get to participate in Winter Field Day nor MNQSOP so I won't have anything to say about those events. Hope those that had the opportunity to play had fun and logged great scores.

However, I am preparing to hit the CQ 160M contest on the 26-28th. I'm up half the night anyway, might as well play the contest and see what I can do this year.

Our local Club nets continue to gather the faithful and some new ones each Wednesday night. We started a conversation about Bacon on HF and it drifted over onto the VHF net. Needless to say, we all went to the kitchen for a snack after the nets. I'm sorry I missed both nets on the 10th. Call it Covid syndrome, I fell asleep, and didn't get up. Some of my meds list drowsiness as a side effect, they are correct.

Our first Zoom Breakfast seemed to be a hit with over a dozen smiling faces attending. Killed a couple hours on Sat morning with good conversations. We will be continuing these so watch the email for announcements and mark your calendar for 0900 on the third Sat. Just recalled, my waitress never did find me!

Around the shack, improvements continue. I fought a battle with the HP printer...again. It went someplace on its own, not to be found by me. I had to uninstall every bit I could find and reinstall it via new Windows 10 instructions from HP. Another 6 hours I'll never get back. Now to get the courage up to do it again on the other Windows 10 computer. While looking for things, I found various connectors on shelves and in boxes in too many places. So, I bought down the four divider boxes and did a total resort. So now I have a box each of N terminals, BNC terminals, UHF fittings and interchange adaptors. I also

have half of the audio and power terminals up here, the rest in the shop. I will integrate those for easier locating.

I wasn't horribly surprised at the total lack of response to my list of needed volunteers in last month's GW. I understand that most of our older members can say "been there done that" and the younger ones feel they are not quite ready to become officers or chairs. Don't let that worry you as you will have the Board members and the others that are standing by to help you. The Club needs that new blood to keep it moving forward, so please rethink your availability to participate.

Another article about a new bright idea for an April Hamfest is above.

From the Workbench of the VP – Kevin Welna, W5LNA

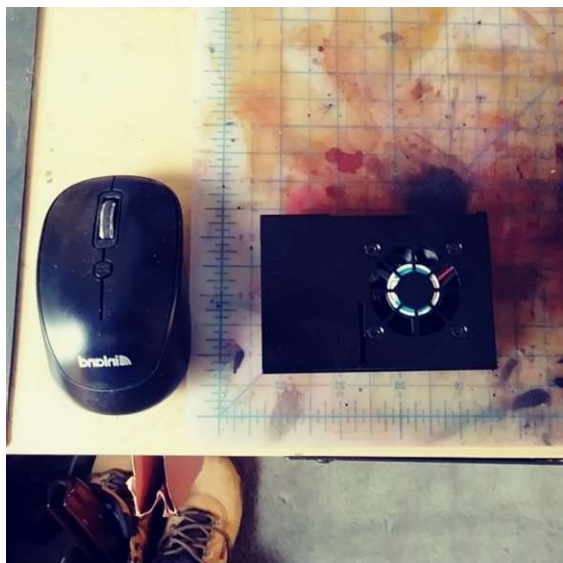
This month's project is a bit like last months. There are no components to solder to a circuit board. It is again a case of loading in an existing program and running it. The difference is instead programming a microcontroller/Arduino we will be programming a microcomputer called a Raspberry Pi 4.

I am a geek at heart and this project hit all the right buttons for me. I just had to have one. This project will definitely boost your geek street cred. This is a great project for you to get your feet wet playing with microcomputers and the Raspberry Pi.

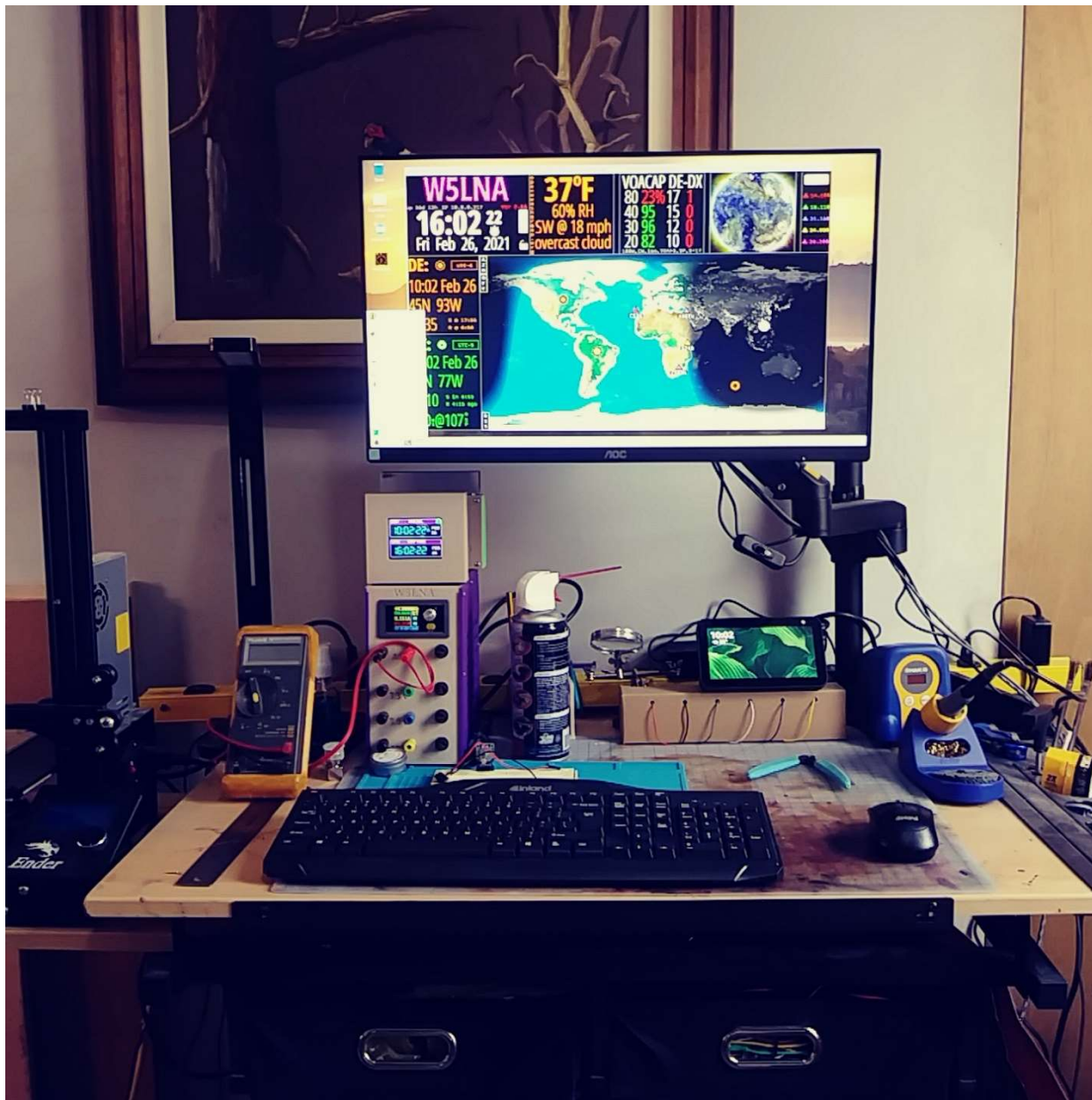
The total cost of this project is about \$200 if you buy everything. The greatest cost is the monitor. So, if you have an unused monitor sitting around that accepts an HDMI input you have already cut the cost by 50%!

The entire computer is about the size of a pack of cigarettes and costs around \$30. In addition, the microcomputer can be used for other ham related projects like programming Arduinos, surfing the net, SDR etc.

Here is a comparison of the Pi 4 and my mouse. The Pi 4 attached to the back of the monitor.



What I really like about this project is once completed, I now not only have a visual real time map of the world and HF propagation, but it is also my bench web browser and programmer for my Arduino projects. I no longer have to lug my laptop from one point to another to get work done. It also looks cool well, it does to me anyway.



My workbench: Notice no wires and no computer box taking up space! All the data around the edge of the map is configurable and editable. The whole thing swings out of the way but can still be viewed if needed. Currently I use this for surfing the net, programming Arduinos, E-Mail and displaying the Propagation map. More to come. I went with the 2-gig model as it was the least expensive option. I believe the 4 gig and 8 gig might be a bit faster, but I do not know for sure. With that said, this is a

microcomputer! It is a bit slower than your regular lap/desk top. Some things take a few seconds to load or change on screen when surfing the net. When you load larger programs into an Arduino, this too can take a few more seconds to a minute to complete. It definitely can slow down (depending upon the applications) when you have multiple applications open at the same time.

The building process is pretty basic. Buy the components, hook them up, and load the program, set the configurations and enjoy. Loading the program and configuration can be a bit of a pain, but if you get stuck, call me and I will try and help you.

BOM - Bill of Materials

Raspberri Pi 4 - \$39 (I got mine from Microcenter – They do not show it on their web site but they should have them in stock.)

Pi4 enclosure - \$15 <https://www.microcenter.com/product/610396/micro-connectors-aluminum-case-with-fan-for-raspberry-pi-4---black> (This comes with a power supply and heat sinks)

Monitor \$110 - <https://www.microcenter.com/product/620538/acer-ek240y-abi-238-full-hd-60hz-hdmi-vga-ips-led-monitor> (Also try Goodwill and FreeGeek they usually have monitors for under \$50)

HDMI Micro Cable \$10 -

https://www.amazon.com/gp/product/B088K2ZHTX/ref=ppx_yo_dt_b_asin_title_o04_s00?ie=UTF8&psc=1

Keyboard & Mouse \$20 - (Watch the ads and you can get these for about \$15 on sale)

<https://www.microcenter.com/product/470511/logitech-mk235-wireless-keyboard---mouse-combo---gray>

Swivel Mount (Optional) - \$40

https://www.amazon.com/gp/product/B08FB7WFCT/ref=ppx_yo_dt_b_asin_title_o08_s00?ie=UTF8&psc=1

Here is the link to the web site I used for this project and the software program.

<https://www.clearskyinstitute.com/ham/HamClock/>

Interested? Email me: kwelna@gmail.com

Ben's Bulletin by Benjamin J. Otto KEØRFZ

An Indispensable Instrument: The NanoVNA

Even a few short years ago when I was entering the hobby, the cost of an antenna analyzer amounted to a sizable investment. MFJ had the monopoly on the market, at an entry cost of \$275 and above. While many hams have strong opinions on MFJ quality control, their antenna analyzers were an extremely popular product line. When it was

time to tweak your new antenna masterpiece, if you didn't own one, you probably borrowed one. If you didn't borrow one, you probably wanted to.

Savvy Chinese entrepreneurs identified the international amateur radio community as an enriching customer base to target. Utilizing SpeedPAK parcel shipping via online marketplaces such as eBay, Aliexpress, Banggood, etc, low cost kits, radios and ham radio accouterments of all kinds became widely available over the past years.

Enter NanoVNA at \$50 American. It fits in a shirt pocket but it packs RF analysis capabilities once relegated to the ivory towers of university electrical engineering labs.

Explaining all the capabilities of this instrument would be beyond both this author's abilities and the scope of a Ground Wave article. (And there is abundant YouTube material for follow up research).

For the purposes of this installment, I'd like to offer a walk through of two functions essential to the amateur. (1) VSWR plot of a chosen frequency range. (2) An interactive Smith chart, which will indicate impedance. The VNA will display both traces simultaneously.

To begin, power up your new unit by sliding the power switch on (next to the jog wheel). Connect SMA port 0 of the Nano with needed adapters to your antenna. (You will need to pick up an SMA adapter assortment, many are available with a quick search on Amazon).

The Nano has 4 user definable traces. To avoid confusion we want to only enable two of the traces for this measurement. Click the upper right hand corner of the screen. A menu will appear. Click "Display" then "Trace." Here you will see traces 0-3. When a trace is enabled its corresponding color appears on the menu.

Begin by turning all traces off by clicking each trace button individually. When it's disabled no color appears in the menu.

For our impedance/SWR test enable trace 0 by clicking it. Now hit "Back," then click "Format." Here you will see the options "Smith" and "SWR" among others. Select "SWR."

Now trace 0 is set. The process is the same for defining trace 1:

Select "Back," then "Trace," press "Trace 1," press "Back," select "Format," then select "Smith."

Our traces are set, now we're ready to define the frequency range for testing.

Press "Back" then "Back." Now select "Stimulus," then "Start." This is where you input your starting frequency. Enter your starting frequency. After the numerals are entered you choose "G" for Ghz, "M" for Mhz or "k" for Khz.

To set the upper limit of the range tap the upper right corner of the screen, then press "Stop." Repeat the same process as above.

Finally, to ensure our test results are accurate it is essential to perform a calibration, after your frequency span has been specified. (Don't worry, it's very easy).

Your Nano will include 3 SMA terminators for calibration with purchase: an open circuit, a 50 ohm resistor, and a dead short.

To calibrate, press the right corner of the screen, hit "Back" until "Cal" is displayed. Press "Cal," then "Calibrate." You will now see "Open," "Short," and "Load." Select "Open" and connect the appropriate SMA adapter, then press "Done." Repeat the same process for "Load" and "Short."

Now you're calibrated and ready to rock and roll.

Upon analysis of the HF antenna systems at the QTH station here, the VSWR and resonant frequencies were nearly too embarrassing to publish. It's easy to under appreciate how dramatically wide range tuners transform impedances.

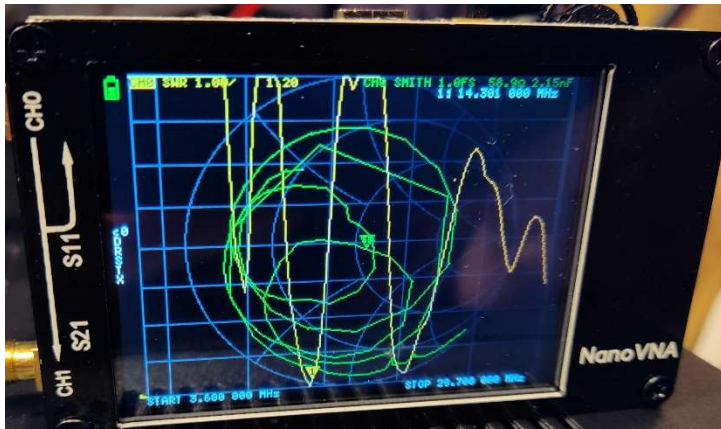
Take, for example, my G5RV from 3.6 to 29.7Mhz:



The yellow trace is VSWR and on the left hand of the screen (which is 40m) and you can see it's off the scales!

I suspect my modification of installing balanced transmission line from the feed point all the way to the tuner may be defeating the impedance matching of Mr. Varney's much venerated original design, which specifies only 33' of ladder line, then terminated to coax.

Here you can see a display of the same frequency range with my MFJ Versa Tuner II set to inductance and capacitance values that result in a 1:1 VSWR on a particular frequency on 20m.



14.301 Mhz is specified here, (shown by the yellow triangle at the bottom) and you can see the magic of the Smith chart in play. The Smith chart marker (green triangle) in the center of the screen reads almost at "1" (the center of the chart, which represents an impedance of 50 ohms neither inductively or capacitively reactive).

However, the 50 ohm impedance is of course a combination of inductive and capacitive reactances, they're just mathematically, physically and electrically canceling each other, resulting in a good match for an HF amateur radio.

The Smith chart was a brilliant development in the 1930s, greatly reducing the mathematics required to solve complex impedance problems for transmission lines (and by extension, antennas). Now, with this \$50 vector network analyzer, we've advanced a step further: no math required.

February 5, 2021 Board Minutes

President Lou called the Zoom meeting to order at 6:06 p.m.

A quorum was present: President Lou Michaels (WD8NOV), Vice President Kevin Welna (W5LNA), Treasurer Allan Klein (WØNLY), Past President Don Kelly (WA6ZMT), Board Members-at-Large Ben Otto (KEØRFZ) and Bob Walsh (WCØJ).

Also attending were Dale Maroushek (NØPEY), Jay Maher (NJØM). Other members arrived during the board meeting.

The club currently has no Secretary. Don Kelly volunteered to take minutes.

The minutes of the January meeting were approved with the correction in Bob's report that the YL is excited about continuing to pursue becoming a ham. (Motion Bob, 2nd Allan, Unanimous).

REPORTS PRESENTED

President—Lou just got out of the hospital after a four-day stay due to wrong meds.

Vice President – Kevin followed up with the prospective ham that Bob had talked to prior to the last meeting. He has posted information about the second club-wide project and will schedule a Zoom meeting to talk about them.

Secretary—(open)

Treasurer—Allan says the numbers are largely unchanged from last month. He has contacted the MN QSO Party to confirm that we will sponsor the plaque.

Past President—Don has nothing to report.

Ben—Nothing new

Bob—Shared CDH's plans to build a STEM lab in the area outside the current Commons entrance. The school has approved Bob being the staff person for the CDH Radio Club.

Membership--Dale says there are 90 members on the books.

Repeaters—Dale said that the UHF repeater gets tickled once in a while, but he's noticed no actual QSOs.

OLD BUSINESS

Auction: Nothing new.

Website: Nothing new.

ID Card: No continuing interest has been shown in ID cards.

Program Chair: Bob suggests we do program scheduling by a committee of the whole (board)—bring suggestions for a brainstorming session for the full year's schedule. Don volunteered to chair the committee and accept emails for the committee to consider. It was pointed out that for Christmas we have no program, and January could be an auction trial run. Multiple members mentioned that there are YouTube presentations that could be used for programs, and with the popularity of Zoom we can have remote presenters that would otherwise not be available. Lou is going to look into someone from the FCC.

NEW BUSINESS

Secretary: A number of people were suggested as potential secretaries, but there are no commitments yet.

Budget 2021-2022: Don and Allan had talked about preparing a budget for the next fiscal year so recurring expenses would be pre-approved. They will draft a budget that the board can review so it can be approved by the May meeting. It was suggested that a fund for program presenter stipends be included.

Winding down food service: Dale said he has some equipment to pass on to future food service volunteers, but no food.

There was a discussion about American Legion ham clubs.

Lou asked if SPRC is interested in accepting donations. Donations are welcome but are not tax-deductible.

SPRC Breakfast: Don will set up Zoom schedules for the third Saturday of each month at 9:00 a.m. starting with 2/20. Emails will be sent to all members and the breakfast will be added to the calendar.

Meeting was adjourned at 6:33 p.m. (Motion Don, 2nd Pete)

February 5, 2021 Meeting Minutes

Our meeting was held via Zoom.

After the ragchew from 7:04-7:30, President Lou Michaels (WD8NOV) called the meeting to order at 7:30 p.m.

A few announcements were made:

CDH plans to build a STEM lab in the area outside the current Commons entrance.

Don Kelly (WA6ZMT) is inviting suggestions for programs for the coming year.

We are looking for someone to join the board to fill the vacant Secretary position.

Only 90 members have renewed for the current year. The member application is available on-line.

There was no other business.

The meeting adjourned at 7:43 p.m. (Don Kelly moved, Pete Guldán (KØCBH) seconded)

Editor's Notes – by Jeff Iverson, WB9DAN

In June 1970, at the age of 15, I passed my General class written exam and 13 wpm code test and received the call WB9DAN, which I have held for over 50 years now. For an HF rig I built a Heathkit HW-100 transceiver. In 1971 I passed the Advanced class exam. I was active on all the HF bands but particularly enjoyed 75 meter nets and ragchews. I also became active in Army MARS. I joined St. Croix County RACES and was given a Gonset Communicator IV that ran 2 meters AM. When 2 meters FM became popular, I jumped on that bandwagon and was active on some of the earliest FM repeaters in the Twin Cities. I also became active in founding the first 2 meter FM repeater in St. Croix County, the 147.33 MHz machine in Roberts. It was also in the mid 1970s that I first joined the St. Paul Radio Club and was active for a number of years. Lately, ham activity has been limited to checking into some 2 meter nets and making a few FT8 contacts. I am still playing chess against the computer, working with the C++ programming language, and playing with my Linux (Ubuntu) computer.

Remember, contributions to the *Ground Wave* are always welcome. Send them in a Word document (.docx) or Open Office document (.odt) as an email attachment to jaiverson@juno.com. Deadline is one week before the next meeting.

Officer Contact Information

President	Michaels, Lou WD8NOV	louthephotoguy@gmail.com	612-638-8159
Vice President	Welna, Kevin W5LNA	kwelna@gmail.com	651-354-5515
Past President	Kelly, Don WA6ZMT	dk@donkelly.biz	651-276-4838
Treasurer	Klein, Allan WØNLY	allankmn@cs.com	612-720-1324
Secretary			
Member At-Large	Otto, Ben KEØRFZ	ke0rfz@gmail.com	651-352-9590
Member At-Large	Walsh, Bob WCØJ	Brw.fsc@gmail.com	612-201-0818

Zoom Information

Until further notice, our monthly meetings in the new SPRC year will be in Zoom. Simply click the link below or call in from any phone. If you're not familiar with Zoom and would like to arrange to practice, text Don at 651 276-4838 or email dk@donkelly.biz.

SPRC is inviting you to a scheduled Zoom meeting.

Topic: SPRC Monthly Meeting

Time: First Friday, 7:30 PM Central Time (US and Canada)

You may join at 7:00 for the half-hour "ragchew," or at 6:00 to sit in on the SPRC Board meeting.

Click to Join Zoom Meeting

<https://us02web.zoom.us/j/83683855241?pwd=Zi9tR2FVanlsVEFoTENCZlI0WTJWZz09>

Or, using any telephone, dial 312 626-6799

Meeting ID: 836 8385 5241

Passcode: 651842

One tap mobile

+13126266799,,83683855241#,,,,,0#,,651842# US (Chicago)

+16465588656,,83683855241#,,,,,0#,,651842# US (New York)

If you use a calendar, download and import the following iCalendar (.ics) files.

Monthly: https://us02web.zoom.us/meeting/tZcrf-ggqz4oHtVwLbEZHWPwR3LQGBE6qJXL/ics?icsToken=98tyKuGrqDMpEtGQsh2GRpwqBlqgb_zwmCVBgrdrizPnJhp7VRPhBLFuA5VdNY7B

SPRC Calendar

Thu Mar 4	On this day in 1977 the first Cray-1 supercomputer was shipped to the Los Alamos National Laboratory, NM
Fri Mar 5	6PM Virtual SPRC Board meeting.
Fri Mar 5	7PM Virtual SPRC Membership meeting (7-7:30 ragchew, 7:30 meeting).
Sat Mar 8	1 PM VE testing. Galilee Lutheran Church. 145 N McCarrons Blvd, Roseville, MN 55113. Reservations required. No walk-ins until further notice. Contact Leon Dill, WØCOE@arrl.net or 651-425-0338.
Sat Apr 3	1 PM VE testing. Galilee Lutheran Church. 145 N McCarrons Blvd, Roseville, MN 55113. Reservations required. No walk-ins until further notice. Contact Leon Dill, WØCOE@arrl.net or 651-425-0338.
Fri Apr 9	6PM Virtual SPRC Board meeting.
Fri Apr 9	7PM Virtual SPRC Membership meeting (7-7:30 ragchew, 7:30 meeting).
Sat Apr 25	Guglielmo Marconi was born on this day in 1874