THE NEWSLETTER OF
THE KINGS COUNTY RADIO CLUB

KCRC

February 2021 "NULLUM BENEFICIUM IMPUNITUM" Volume 8, Issue 2

Minutes of the February 3rd 2021 KCRC Meeting

Our February "Pre-Meeting Question and Answer Session" tabled for WebEx small talk.

The monthly meeting was called to order at 8 PM, by our acting President, Joseph AC2AE. Also present at tonight's meeting were Treasurer Frank KD2QPU, Secretary Roy AC2GS, Executive-At-Large Board Member and Berlotte KD2MYF, Howard N2GOT, Richard KA2KDQ, Howie KD2MSU, Bob KD2NVB, Glenn N4ESU, Nick N2HVR, Joe KD2MLY, Selvin KB2WON, Yona KD2TFD, Ralph KD2RN, Andre W2ART, K2JVX, Lloyd K2JVX, and our guest Dorothy.

The vote to accept the minutes of the January meeting was passed unanimously.

Treasurer Report—Frank KD2QPU reported that our Treasury currently has $2,507.89 in our bank account as well as $748.22 in our PayPal account for a total of $3,256.11 in assets.

Repeater status was discussed by Joseph AC2AE - The voice announcements still need to be optimized for the controller's speech synthesis circuits—this is planned for the next routine maintenance visit to the repeater site. Adding additional links to our Wires-X room continue. A suggestion was made to look into a purchase of a new power amplifier. We will ook into a commercial grade 100+W power amplifier capable of tolerating the duty cycle that repeaters can be subjected to. Joseph made a request for volunteers to join Mitch and himself on the Repeater maintenance committee. Glenn N4ESU volunteered.

2 Meter Net Report—Selven KB2WON reported consistent activity on the Net. of 12-15 check-ins, weekly.

10 Meter Report—Roy AC2GS reported that the 10 Meter Net is doing well, with mostly local check-ins, and has been going on from 11 AM to approximately 1 PM each Sunday.

KCRC TechNet—Roy AC2GS reported that the TechNet is alive and well, BUT that it suffers from little participation at the very beginning of each Net. We still need people to join in with either questions, topics, or their own observations., preferably at the beginning of the Net.

Fusion Net Report—Joseph AC2AE reported that the FusionNet had dropped to approximately 17 check-ins since after the holiday season. He mentioned that our Wires-X room is now linked to the TGIF and QuadNet servers..

Old Business: We continued our 2021 year elections. Glenn N4ESU accepted the nomination for President and Selvin KB2WON accepted a nom,ination for Vice President. Both were elected unanimously by the members of

the General Meeting.

There is no new information, regarding our VE Sessions. For the time being we are referring interested parties to the Columbia University VE testing site. We continue to investigate alternative options for our own VE Sessions. An attempt was made to cross promote the KCARES VE sessions, but the VE team leader has failed to respond to two email requests.

We have 88 members on our Roster. Forty members are paid up for 2021 (46%) and eight members are paid up until the end of 2023.

We are still selling Club patches at $5 a piece and $1 shipping and handling. You can save the shipping and handling fee by buying them at our monthly meetings (when they are re-established).

We discussed options for a place for regular meetings after social distancing measures could be eliminated. Selvion KB2WON suggested Floyd Bennet Field which might be difficult for some members to get to via mass transit. Joseph suggested we institute carpools for those people. Selvin KB2WON also suggest a local school house that might allow us to use a room—it is better located for mass transit. Howie KD2MSU suggested a meeting area in his apartment complex in Coney Island, that we might be able to lease 1-2 times a month.

There was one nomination for President of the Club for 2021—Glenn N4ESU, who will have been a member in good standing for one year, by next month's elections. No one was nominated for Vice President, but it is hoped that someone will decide to run before our next General Meeting in February, when elections will be held.

New Business:

Glenn N4ESU reminded members that the Florida Hamcation would be held virtually on February 11-13, and that they would be giving out door prizes to those that register for the event.

The meeting was closed 8:58 PM to give time for the members of the KCRC Executive Board to shift over to a Executive Board Meeting in another Webex session, with our new President and Vice President.

Stay Safe Everyone!

These minutes were respectfully recorded and submitted by Roy AC2GS on this day, February 3rd, in the two thousandth and twenty-first year of our Lord of Propagation.

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What's A VNA?

What once looked like this:

But now looks a lot like these:

A Vector Network Analyzer, technically, is defined as a form of RF network analyzer capable of measuring the amplitude and phase of a circuit's parameters. It is made up of a low amplitude signal generator, a number of test sets that take the signal generator output and routes it to a device under test. Most VNAs, used solely as antenna analyzers, have only one test set. The NanoVNA has two test sets or two ports for more esoteric VNA tests. The next stage in a VNA is the receiver, which makes the measurements, and the final stage is a processor/display, where the values are processed for visual display.

We will leave the more esoteric capabilities of a two-port VNA for another time and another article and focus upon the use of a single port VNA.

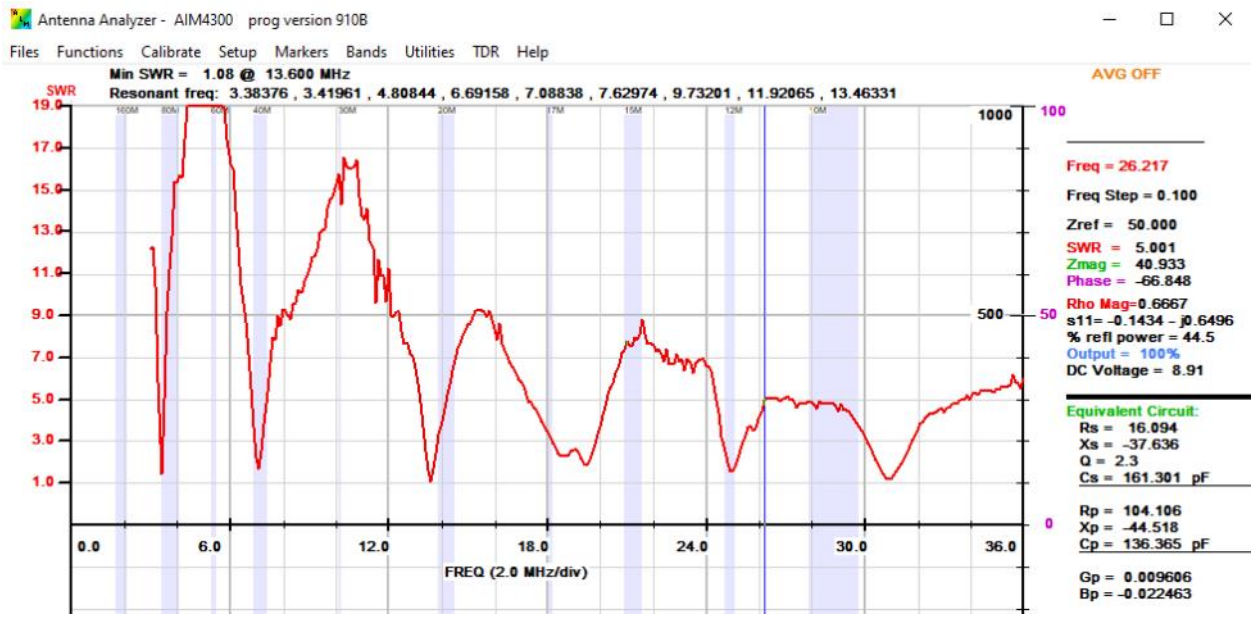
Calibration is an especially important part of using a VNA. Some manufacturers stress the importance of calibrating your VNA before any session of measuring, while others seem to indicate that it can be useful but not necessary for routine use.

Although the user should follow the manufacturer's recommendation, I would caution readers that there is no such thing as calibrating too much. When in doubt, calibrate!

The process is quite simple. At the point that the test equipment would be connected to the port, replace it

with a series of three standardized calibration value connectors – short, open, and 50 ohms. The VNA should guide you through the process. Save the calibrations and begin your measurements.

But what can you measure with a single port VNA? Well, most Hams will be interested in sweeping a given bandwidth for impedance value, SWR, or Return Loss. This will give you a good visual indication of where your antenna is resonant and how wide the acceptable bandwidth is prior to the application of an additional antenna tuner.



In addition, many Hams find the Time Domain Reflectometer (TDR) measurement particularly useful. The TDR function sends an RF pulse down your transmission line, and by inserting the velocity factor (percentage of the speed of light in a vacuum that your transmission line propagates current), you can measure your length of transmission line and discover any impedance values off from the 50 ohms of impedance most cables are designed for. For example, if a length of coax is twisted too tightly, its center wire may get deformed off-center of its dielectric, with a shift in its impedance at that point, producing wasteful RF reflections. You can even check the condition of coax splices or problems with jumper cables on your transmission line.

It is always wise not to use splices or jumpers when they can be done without. But ours is not a perfect world.

It may be a bit obsessive-compulsive, but it is a diligent practice to sweep your transmission line every so often to check on its impedance and the health of its transmission line. Just in case…

Are all VNAs alike? No. The first image of this article is the very first VNA, a Hewlett & Packard HP 8407 sold in the mid 1960's. I am not quite sure of its original list price, but it may have been around $13,000. Used models seem to be selling on eBay for $300+. State of the art VNAs can cost many tens of thousands of dollars. They don't seem to post many prices. They just suggest you email them for a quote. I guess it is a matter of 'if you have to ask how much, you can't afford it'? A Rhode and Schwarz ZVL13.13 VNA is going new for 'only' $39,190.

And then you have that NanoVNA, that can go for as little as $50. They can't be the same kind of machine.

Well, they're not. The Rhode and Schwarz go all the way to 13.6 GHz and has much better dynamic range and lower noise figures, and many bells and whistles, and if you were doing engineering work at a defense

company, you would have more than enough in your budget for an odd dozen Rhode and Schwarz VNAs. But being a Ham on a budget, the NanoVNA is a great gadget. If you invest a little more into something like a RigExpert or an Array Solutions VNA, no one will judge you as a spendthrift.

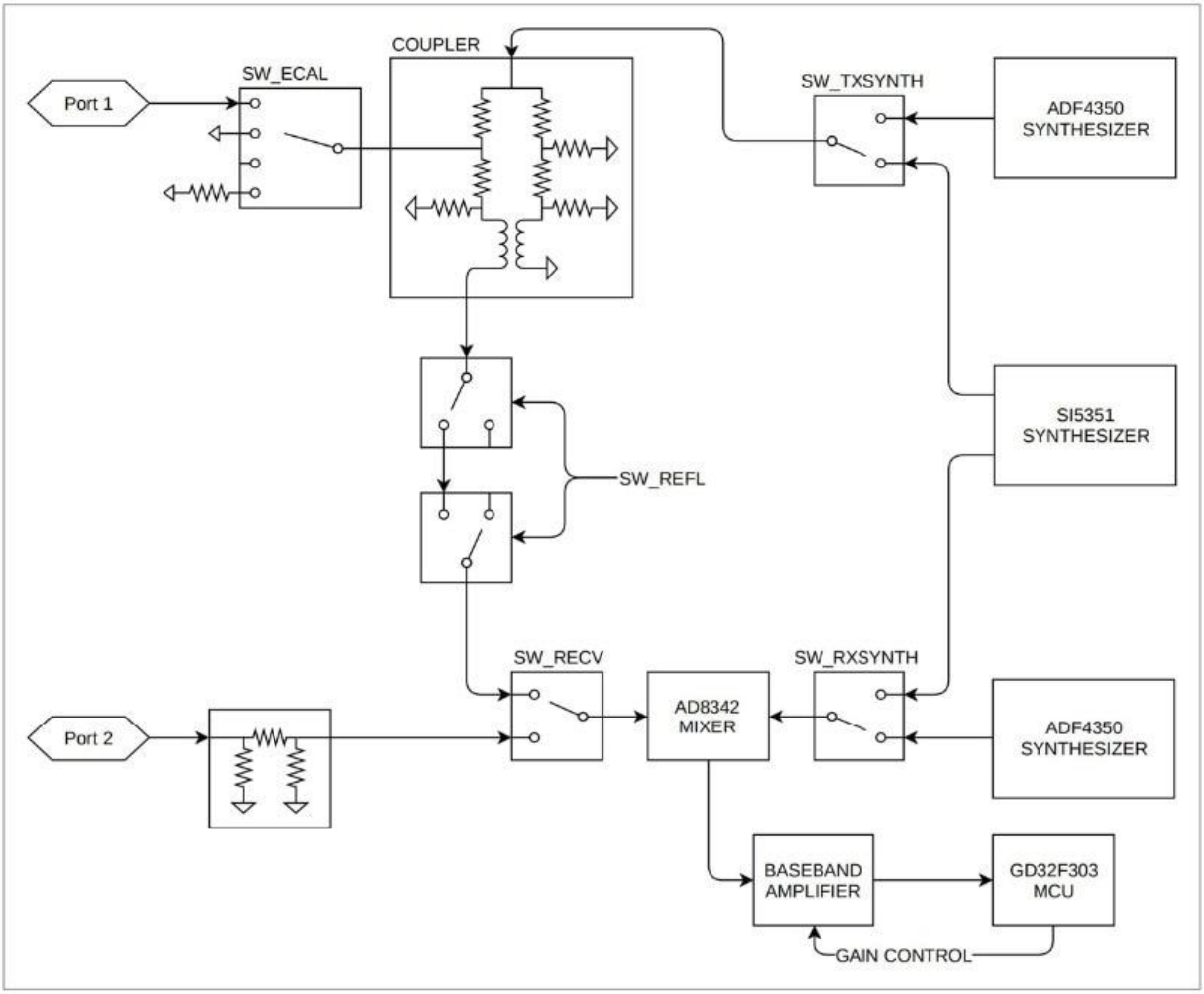
So, that is my short overview of VNAs. There is a lot more to this kind of equipment, and if this article has whetted your interest, Google is your friend!

Enjoy the adventure!

Appendix I – Hardware architecture

The S-A-A-2 is a highly cost optimized design that aims to achieve the best possible RF performance within a tight BOM budget.

The following block diagram shows a high level overview of the system.



The S-A-A-2 is a single switched receiver VNA. While the diagram shows only two channels selectable by the receive mixer through SW_RECV, a third channel, the reference channel, is provided by setting SW_ECAL to the "open circuit" position. By controlling these two switches the receiver is able to observe reference, reflected, and thru signals.

Vy 73,

Roy AC2GS