

THE NEWSLETTER OF THE KINGS COUNTY RADIO CLUB

KCRC



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March 2021

“NULLUM BENEFICIUM IMPUNITUM”

Minutes of the March 3rd 2021 KCRC Meeting

Our March “Pre-Meeting Question and Answer Session” tabled for Zoom based small talk.

The monthly meeting was called to order at 8 PM, by our President, Selvin KB2WON. Also present at tonight’s meeting were Treasurer Frank KD2QPU, Secretary Roy AC2GS, Executive-At-Large Board Members Berlotte KD2MYF, and Jason KD2LRX, Joseph AC2AE, Mitch N2RGA, Howard N2GOT, Richard KA2KDQ, Howie KD2MSU, Bob KD2NVB, Glenn N4ESU, Nick N2HVR, Joe KD2MLY, Alan KD2OMG, William AC2ZV, Max KD2VEA, Ralph KD2RN, and Victor.

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

In the past month Glenn N4ESU decided to resign from the office of Club President, and Selvin KB2WON succeeded to the office of Club President. This leaves the office of Club Vice President vacant. Nominations are open for Club Vice President. Anyone in good standing with the Club and has been a member of the Club for more than one year is eligible. They can nominate themselves, or be nominated by another member. Nominations for Club Vice President will be open during our next General Meeting in April 2021.

Treasurer Report—Frank KD2QPU reported that our Treasury currently has \$2,545.58 in our bank account as well as \$947.13 in our PayPal account for a total of \$3,492.71 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 continues. A suggestion was made to look into a purchase of a new power amplifier. Joseph AC2AE has investigated available Henry continuous use amplifiers models—a 100 Watt continuous model and a 250 Watt continuous model. There is a spare power supply at the repeater site, but the 250W amplifier will require a new power supply rated for 45 amps at 13.8V. It was decided that a thorough evaluation of the Repeater site’s available safe power must be undertaken before any decision in favor of the higher power linear amplifier. Max KD2VEA, and Joe KD2MLY volunteered to be part of the KCRC Repeater Committee. Work on additional Repeater gateways continue. Joseph AC2AE is working to resolve some ‘Wires-X errors’ that have cropped up lately.

2 Meter Net Report—Selvin KB2WON reported consistent activity on the Net. of 9-12 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—Jason KD2LRX reported that the FusionNet has on average 25+ check-ins each week, during the past month. He is working on obtaining Net Control Operators for more Western time zones, where participants are still interested in continuing the FusionNet into the late hours.

Old Business: 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. Selvin KB2WON advised us that a Public School IS 35 might be amenable for our VE Sessions as well as our monthly General Meetings, when we are able to meet once again.

We have 90 members on our Roster. Forty members are paid up for 2021 (59%) and nine 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. Selvin KB2WON suggested Public School IS 35.

Field Day 2021 was discussed. It is still unclear whether Floyd Bennet Field, or any public places will be available, due to Covid-19 by the time of this year's Field Day. It was decided that an inventory of our available equipment be made, to assess if we need to purchase anything for Field Day 2021. Mitch N2RGA will have to bring the Club's generator to a service dealer for recall modifications.

New Business: Jason suggested that we consider some form of Anniversary Club Patch.

There was a discussion of establishing a web page with the history of the Kings County Radio Club—Joe KD2MLY volunteered to research the Club's history, and Roy AC2GS volunteered to help shape it into an entertaining tale for our website.

Mitch N2RGA recommended that all club members receive the planned meeting agenda that has been distributed before the meetings to the executive board, in the past. Roy AC2GS, who is responsible for creating the planned agenda proposed an 'Opt-In' list. The next email for the newsletter will include a copy of the planned agenda, with a request that anyone who wishes to continue receiving it must personally email a request one time to Roy AC2GS.

The meeting was closed 9:13 PM, and was followed by an informal general discussion

Stay Safe Everyone!

Disclaimer: The views and opinions expressed in this publication are those of the author and do not necessarily reflect the official policies or positions of the Kings County Radio Club, its Executive Board, nor its General Membership.

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

The Kings County Radio Club is at www.KC2RC.com or
www.KingsCountyRadioClub.com
KCRC is an ARRL affiliated club (see: www.ARRL.org)

So, You Want to Build Your Own Electrically Tuned, Mechanically Shortened, Inductor Loaded Antenna?



In a perfect world, you would have antennas built to be mechanically the right length, an odd multiple of the wavelength that you are interested in communicating on—usually quarter wavelength dipoles, or quarter wavelength monopoles, with radial arms as a counterpoise.

But we live in a decidedly imperfect world—a world of compromise antennas and a limited space that we can dedicate to our antennas. And so, our antennas must fit into smaller and smaller spaces.

So, we shorten our antennas, but with what effect?

As we shorten our radiating antennas from their optimal $\frac{1}{4}$ wavelength, the antenna's impedance goes from a 'real' resistance of approximately 50 ohms to a higher and higher, mostly capacitive reactive impedance. As our capacitive impedance rises, our radiation resistance (the 'resistive' power being 'lost,' not as waste heat but transformed into electromagnetic waves, propagating to the fellow trying to hear you on his radio) decreases, and any insertion loss in your antenna system produces an ever-increasing loss in antenna efficiency.

The point of this article is how to make the best of a problematic situation.

One of the most important things that have to be dealt with is transforming this resultant high capacitive impedance into something around the 50 ohms of impedance that your transmitter is designed to transfer its power into.

You can do this with an impedance matching circuit placed at the feed point of your shortened antenna – either an inductive coil or an impedance transformer. But, you don't have to have that inductive coil at the feed point. You can incorporate it into the design of your antenna!

And thus, was born Electrically Short, Inductor Loaded Antenna!

All compromise antennas have their own benefits and their 'costs.' Here, the benefit is a smaller, unobtrusive antenna. The 'costs' for this convenience are many and varied.

The most important factor in the efficiency of your shortened antenna is how much you shorten it. If you have designed it to be 95% of its quarter wavelength, the efficiency losses, depending to a degree on your design choices, will be minimal. If you are shortening your antenna to be only 5% of its quarter wavelength, some design options *might* offer you 100% improvement over others – from 1% efficiency all the way up to 2% efficiency (keep in mind that 100% of 1% is just another 1%)!

The loading coil to correct a shortened antenna's capacitance depends upon how 'short' your antenna is and where you plan to put the coil. You need the least amount of inductive reactance if you put the coil at the base of the antenna, but because most of the radiating power occurs near the feed point, the loading coil will couple to an antenna and offer you the least efficient design. As you position the loading coil higher and higher up the antenna, it will need to have a greater and greater inductive reactance to neutralize a greater and greater capacitive reactance of the relatively shorter and shorter antenna segment remaining at the tip of the antenna. Were you to place the loading coil at the very tip of your antenna, it would require an infinite amount of inductive reactance and would snap your antenna into pieces by its sheer weight!

As you move the loading coil up further and further away from its base, you will need a bigger inductor with a higher inductive reactance to balance the shortened antenna's capacitive reactance. Larger coils have more resistance and more insertion loss! Larger coils with less resistance introduce a higher 'Q' for the antenna, creating a narrower bandwidth where the antenna will be resonant at! The radiation resistance and thus, the efficiency of the antenna does improve as you raise the loading coil higher and higher.

But then, if the coil is too high, it must be very big and very heavy and mechanically less stable.

Although most people feel that the 'sweet spot' for a loading coil, in most circumstances, is about $\frac{1}{3}$ from the tip, it is very common to see bottom-loaded and center loaded shorted antennas.

Sometimes mechanical stability is the most important thing about a given antenna design.

So, your choices are:



That is a short overview of the electronically short, electronically tuned antennas with a coil. You

can buy one off the rack as most Hams do these days, but you can choose to make one yourself if you are so inspired.

I will spare you the math involved...

$$L_{\mu H} = \frac{10^6}{68\pi^2 f^2} \left\{ \frac{\left[\ln \frac{24(234-B)}{D} - 1 \right] \left[\left(1 - \frac{fB}{234} \right)^2 - 1 \right]}{\frac{234}{f} - B} - \frac{\left[\ln \frac{24(\frac{A}{2}-B)}{D} - 1 \right] \left[\left(\frac{\frac{fA}{2}-fB}{234} \right)^2 - 1 \right]}{\frac{A}{2} - B} \right\}$$

...and I would suggest that you check out these websites that have built-in calculators. Just plug in your values, and they'll give you the resultant calculation> No slide rule, no Reverse Polish Logic calculator needed!

[Coil-Shortened Vertical Antenna Calculator](https://www.66pacific.com/calculators/coil-shortened-vertical-antenna-calculator.aspx) (<https://www.66pacific.com/calculators/coil-shortened-vertical-antenna-calculator.aspx>)

[Coil-Shortened Dipole Antenna Calculator](https://www.66pacific.com/calculators/coil-shortened-dipole-antenna-calculator.aspx) (<https://www.66pacific.com/calculators/coil-shortened-dipole-antenna-calculator.aspx>)

[Coil Inductance Calculator](https://www.66pacific.com/calculators/coil-inductance-calculator.aspx) (<https://www.66pacific.com/calculators/coil-inductance-calculator.aspx>)

Happy tinkering and good luck with your antenna design!

Vy 73,

Roy AC2GS