B-PLUS

Albany **A**mateur **R**adio **A**ssociation – AARA

May 2025

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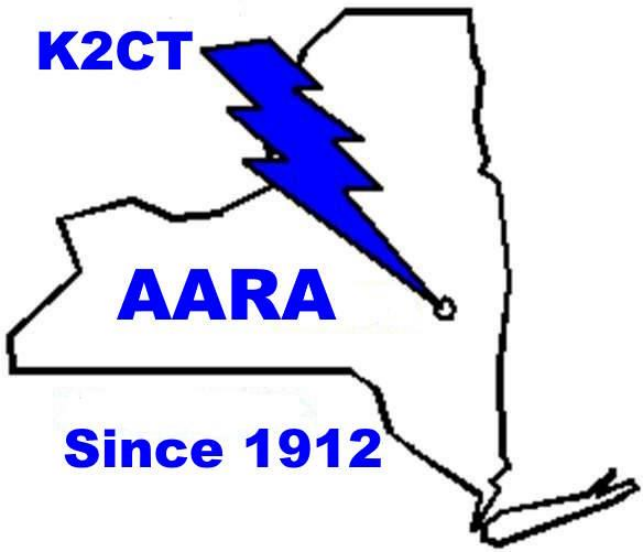


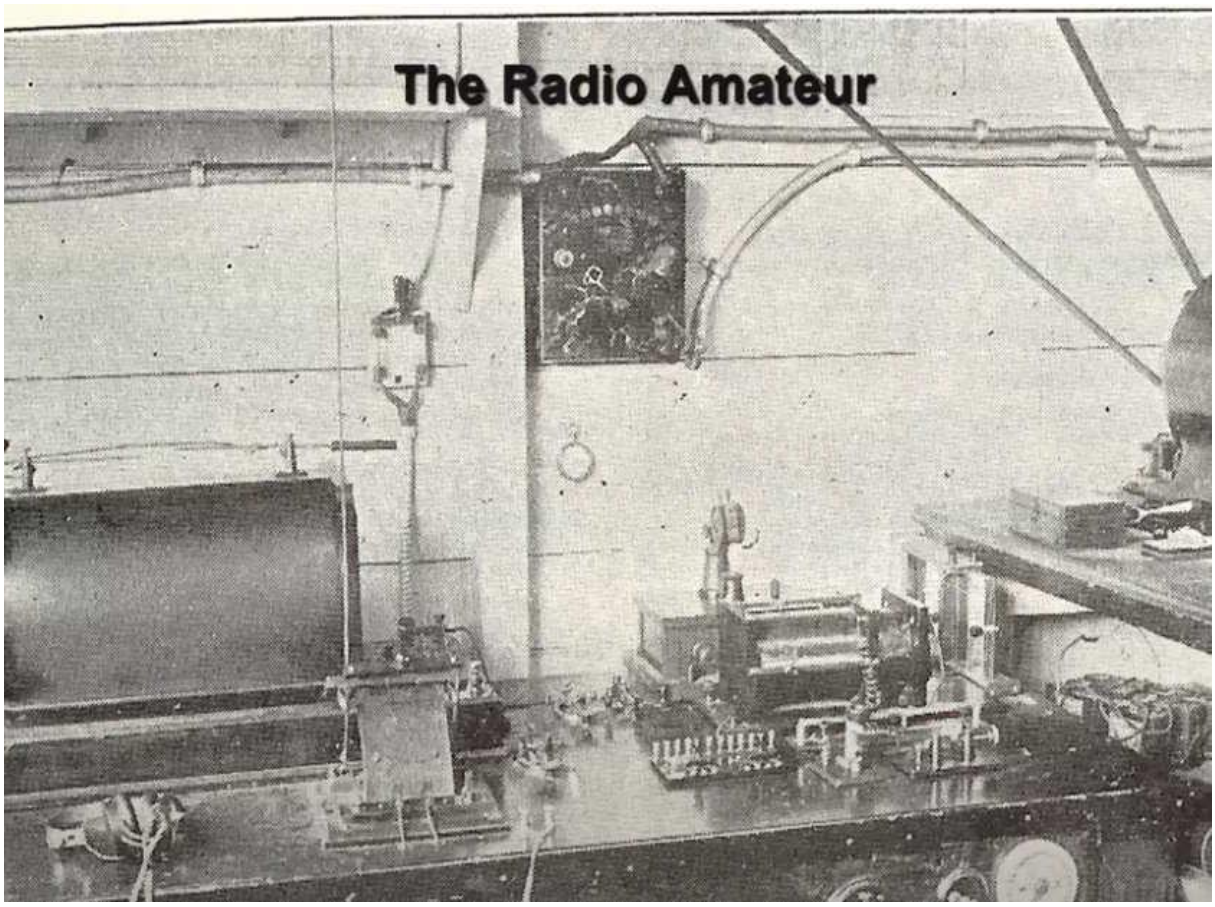
AARA Next Meeting:
Wednesday, May 7th, 2025
@ 7:30 PM
Slingerlands Fire Dept.

Topics:
Antenna Matching
Field Day

PLEASE Pay Your Dues
Dues are $20
Checks can be sent to:

Saul Abrams, K2XA
307 Maple Rd.
Slingerlands, NY 12159

April Meeting



April's meeting featured a video by Radio Amateur Training Planning and Activities Committee (RATPAC) on "An Early History of Radio".
This video is available on www.youtube.com

Winter Field Day Results

The official 2025 WFD results are now up on winterfieldday.org.

The listed results for our K2ALB operation at Lawson Lake County Park (Category: 4 Indoor or four transmitters in an indoor place not otherwise used as an amateur radio station); are as follows:

K2ALB was #10 North America in the Indoor category (out of 452 entries) with 903 recorded two-way contacts, 23 objective multipliers (91%) for a total score of 41,538 points.

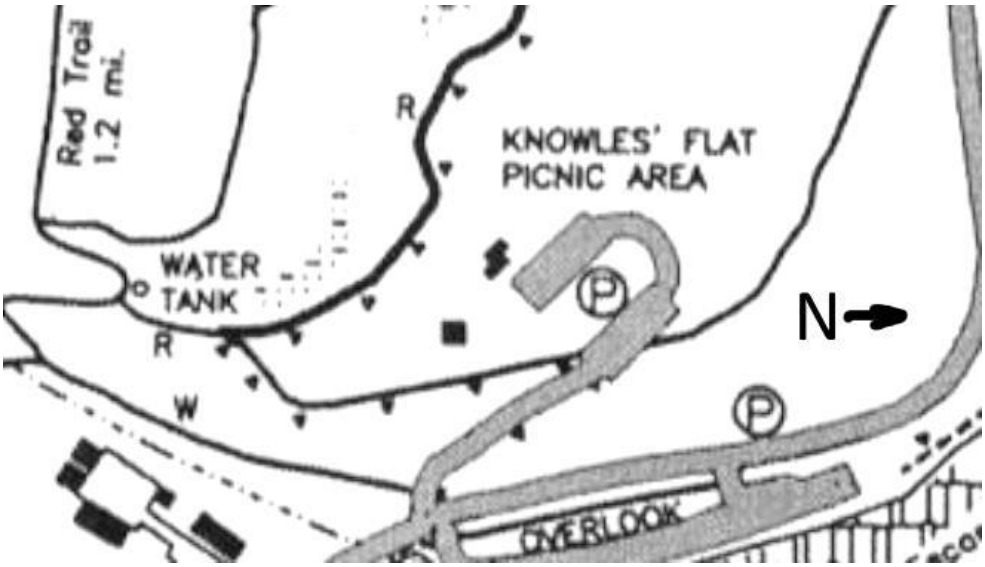
There were 7 Indoor entries in the Eastern New York Section, K2ALB's score of 41,538 placed it #2 ENY. It was the entry with the highest objectives completed (91%) in the Section.

K2ALB was one of only three stations nationwide in the Indoor category that achieved a 91% rating. Significantly, no station in the group achieved a higher rating. As to the 4 Indoor category, K2ALB was #2 nationwide out of 51 entries.

This was a stellar effort! Many thanks to all who were involved in the setup, operation and teardown.

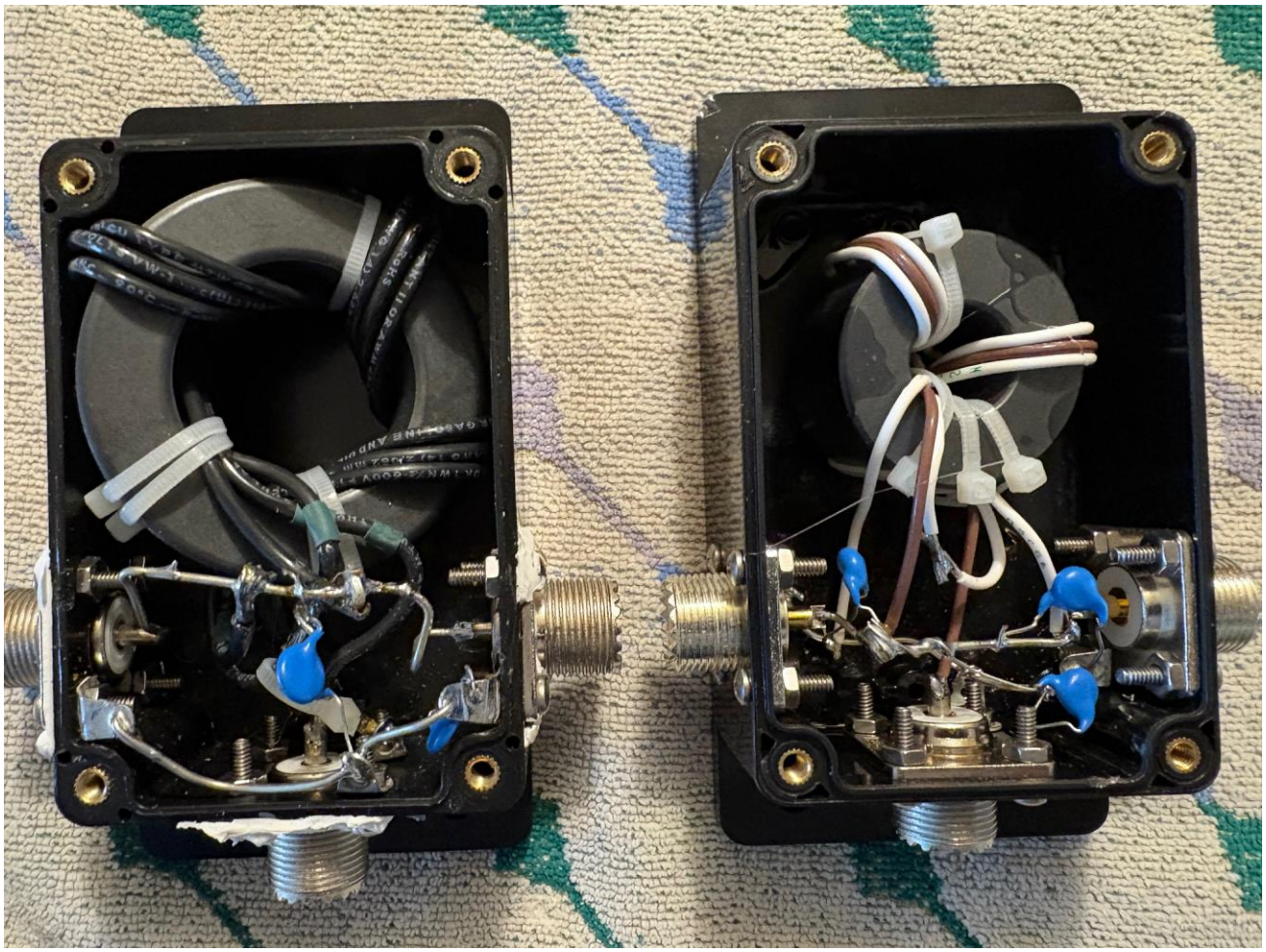
-Dave Galletly KM2O

Field Day 2025



Due to a scheduling conflict, our Field Day Site will be at Knowles Flat this year. We have done Field Day there before. Site arrangements will be discussed during our May and June meetings.

Fred's Sandbox
Playing with Toroids



I am beginning to teach myself things about toroids that they don't publish in the books, manuals, or articles. The two designs pictured above are intended to solve the same problem, add two tribanders as efficiently as possible. We used the one on the left during the June 2024 Field Day exercise. It worked OK, but I was not satisfied. The one on the right measures much better, uses a cheaper toroid, and can handle more power!

The left design came from the original article in QST describing what is now known as a Stackmatch. It uses 4 trifilar turns of #14 copper wire on an FT-240-43 core. The concept is by using a 3 wire transmission line connected as a 1.5:1 turns

ratio it would have a 2.25:1 impedance ratio. This means that two 50 ohm antennas connected in parallel for 25 ohms would be transformed to 56.25 ohms; which is an SWR of 1.125:1. It is also touted as a combiner for three antennas (50/3=16.67 ohms) which, when transformed becomes 37.5 ohms, an SWR of 1.33:1. By itself, that's not a bad SWR, but if you tune your amplifier for maximum output and/or best linearity; as you switch between antennas you end up with BOTH lower output power and nonlinear amplification! I find that unacceptable!

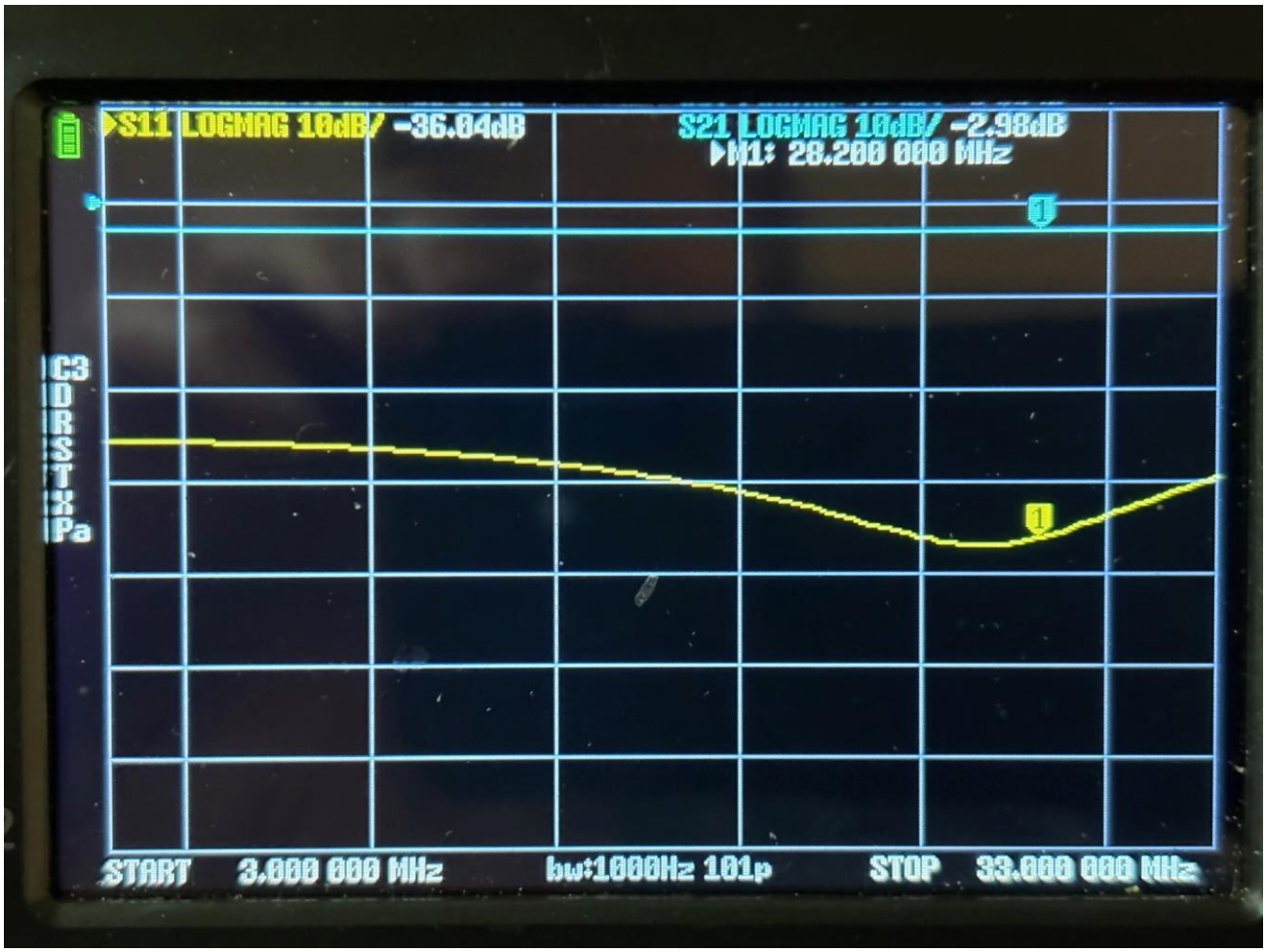
You will note that there are several blue ceramic capacitors connected to the toroid. I discovered that by adding 100 pf from the toroid output to ground, the impedance ratio became much closer to 2:1 for a better two-antenna match. Yet that match was best on 15 meters, and did not improve the SWR on 10 meters as much I would have liked. It appeared that there was too much inductance on the toroid, but we used it anyway. This tweaking of the design has not been published.

In the process of experimenting with EFHW antennas I purchased some toroids made with the same type 43 ferrite mix as the FT-240, but intended for use as a EMI reduction core. This one has a smaller diameter, but is thicker. The cross section area of the magnetic flux portion of the toroid is roughly 50% greater that the larger core, but uses less ferrite, so it's actually cheaper and can handle 50% more power.

Because I knew that the first design had too much inductance for 10 meters I opted to use only three turns on the second attempt. To make sure that I could get three turns of wire on a smaller core I obtained some high temperature silver plated #18 Teflon wire. Because of the skin effect of RF, a significant amount of the current runs on the surface of the high conductivity silver plated wire. The first measurements on my VNA were excellent, which proved my assumptions to be correct. Next I added 81 pf of capacitance to the output of the toroid to tweak the high frequency performance. The final results were impressive;

return loss	VSWR	frequency
-36.0 db	1.032:1	28.2 MHz
-31.8	1.053:1	21.0
-27.5	1.088:1	14.1
-25.7	1.110:1	7.2
-25.5	1.112:1	3.6
-25.2	1.116:1	2.0

Some of you may be curious how to measure the performance of a three terminal device. I connect the SWR port (S11) to the combined port, terminate one of the antenna ports in 50 ohms, and connect the through port (S21) to the second antenna port of the toroid.
The yellow trace is the reflected power vs frequency, (measured as db below input power) the blue trace is circuit loss vs frequency. The SWR measures properly as both ports have 50 ohm loads. As expected, there is loss in the combining process, and if it equals 3.01 db, there is no extra loss in the toroid! In looking at the display you may conclude that here is at least a .03 db error in the calibration of my VNA or a small variation in the termination value connected to the second antenna port.



These results point out an important characteristic of transmission line ununs. They are not transformers with a primary and secondary. They are magnetic traps for stray fields caused by imbalance in the windings. They have exceptional

bandwidth and extremely low losses. Because the windings are designed to be balanced that means that in normal use, there is no flux in the magnetic core. No flux equals almost no loss and power is limited more by wire thickness than the size of the core.

After Field Day I plan to do more testing of mix 61 and mix 52 ferrite material that is less used my most hams. (Hint; 43 mix can have issues on 10 meters.)

Just a note to watch out for my article in June QST called "The Tomato Stake antenna, an Optimized 6 Meter Array."

As always if you have suggestions for future articles or any questions, please email me **at felasstic@yahoo.com**

The 13 Colonies Special Event

The 13 Colonies Special Event will take place this year from July 1st through July 7th. Multiple stations in each of the original 13 colonies will be on the air on all of the HF bands as well as some limited VHF/UHF operation. Operation will be on voice and cw, as well as multiple digital modes. The 13 Colonies stations will have special event call signs from K2A through K2M. There are also 3 "special" stations. These are WM2PEN (Philadelphia), GB13COL (Great Britain), and TM13COL (France). It is currently looking like there will only be QSL cards this year without any certificates being issued. In past years a certificate was available for working as little as a single station. Endorsements were available for a "clean sweep" of all 13 colonies as well as endorsements for the 3 "special" stations. Various other endorsements were also available. It is likely that certificates will again be available in 2026.

Each of the Colonies as well as the Special stations all have their own QSL card available. The 13 Colonies web site has information on where to send your card to. I am the QSL manager for all of the K2A (New York) contacts. This is now my

10th year as the K2A QSL manager. The mailing address for my call sign (N2SQW) is available on QRZ. The mailman has once again been warned!

This event was the idea of Ken Villone, KU2US. The first year of operation was 2009, with approximately 25,000 contacts made. Last year there were just under 300,000 QSOs with the various special event stations.

The web site www.13Colonies.us has information regarding the various QSL managers as well as much additional information about the event.

Ken Goetz N2SQW

Swap Shop

Have radio gear you want to buy, sell, trade, or give away?

Please send your item descriptions to wa3afs@arrl.net or dgherring@hotmail.com

Important Links:

Find a license class in your area: www.arrl.org/class

Find a license exam in your area: www.arrl.org/exam

The Eastern Iowa DX Bulletin:

http://www.eidxa.org/EIDXBulletin.html