JOHNSON COUNTY RADIO AMATEURS CLUB, INC.
P.O. Box 93
Shawnee Mission, KS 66201

FEEDBACK

NOVEMBER 2020

Making the most of a vertical antenna

John Raydo, KØIZ

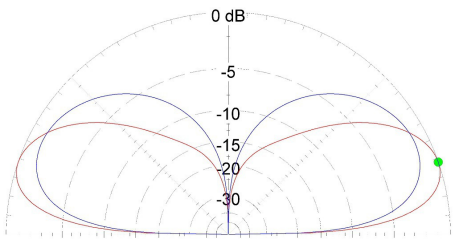
I needed a 20-meter antenna here at my Kansas City home. Installing a dipole would be difficult so a vertical seemed the best choice. I used EZNEC to simulate possible configurations and presented my analysis at our club's October 23rd Zoom meeting.

I found a tree near the house with a suitable limb 32 feet above ground. I could dangle a 16 1/2 ft. wire from this limb to create a simple quarter-wave vertical. With this tree limb I could raise the bottom up to 14 feet above ground. Would that be better than a typical ground mounted vertical?

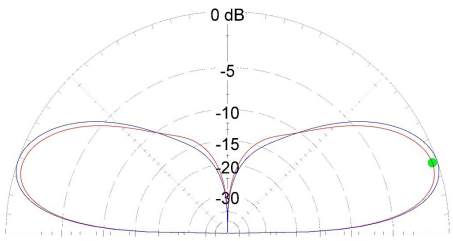
Figure 1 shows the elevation plot for both ground-mounted and elevated (in red) verticals. You will note that the peak gain of the elevated version is about 1.5 db greater. This is equivalent to a 40% increase in power. The peak angle of radiation is also lower at 19 degrees vs. 27, excellent for DX.

Ground mounted verticals need radials, preferably plenty of them. The elevated vertical in this simulation only used four, called counterpoises. Unlike non-resonant radials on or in the ground, counterpoises must be quarter wave in length. A question was asked at the meeting if fewer counterpoises would work, for example if the antenna were next to a house. Figure 2 shows an elevation plot comparing two and four counterpoises. There is virtually no difference in either elevation or azimuth, less than ½ db.

see RAYDO on page 2



Raydo: Figure 1



Raydo: Figure 2

NOVEMBER MEETING

November 13 *– Most Accurate Clock – Tom Wheeler, NØGSG*

November 27 *- No Meeting - Happy Thanksgiving*

The Johnson County Radio Amateurs Club normally meets on the 2nd and 4th Fridays of each month at 7:30 PM at the Overland Park Christian Church (north entrance), 7600 West 75th Street (75th and Conser), west of the Fire Station.

Much of the membership travels to the Pizza Shoppe at 8915 Santa Fe Drive for pizza buffet and an informal continuation/criticism/clarification of the topics raised at the meeting ... or anything else.

LEAVE THE CHURCH, TURN RIGHT (WEST) ON 75TH. TURN LEFT (SOUTH) ON ANTIOCH. TURN RIGHT (WEST) ON SANTA FE. PIZZA SHOPPE IS JUST PAST THE SONIC ON YOUR LEFT.

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-> FEEDBACK <-

A publication of the
Johnson County Radio Amateur Club, Inc.

Bill Gery, KA2FNK, President

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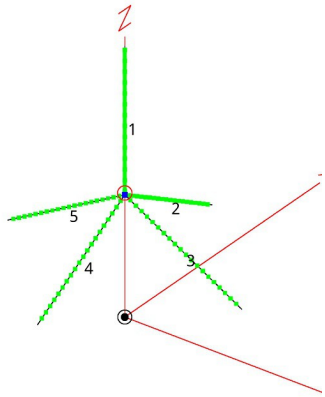
from RAYDO on page 1

My counterpoises droop down to about six feet above ground at the ends. See Figure 3. This raises the antenna impedance from 36 ohms to 49 ohms and reduces SWR from 1.4 to 1.02 with 50-ohm coax. I measured the actual antenna using my nanoVNA. My counterpoise ends were tied to available trees and didn't quite match the simulation. Resonance is 14.175 Mhz (vs target of 14.25) and a 1.02 SWR. Shortening the vertical by 1.25" would move resonance to the target 14.25 Mhz. I didn't bother since SWR there was only 1.09.

Simulations for 10 ft. to 20 ft. above ground showed no difference compared with my 14 ft. Counterpoise droop, however, should be maintained at about 8 ft. (14 to 6 or equivalent).



Raydo: Fig 3.

In summary, raising the base of a vertical above ground increases gain and lowers the radiation angle. Drooping the counterpoises improves SWR to virtually 1:1. Actual antenna measurement verified the simulation. Two counterpoises work virtually as well as four.

If you have a handy tree limb an elevated vertical might fit your backyard.

>> JCRAC FEEDBACK <<

PRESIDENT'S CORNER

Congratulations to Greg (KIØKK) for have the winning ticket for the $400 gift certificate at Associated Radio. We will have to ask Greg what new equipment he is adding to his Ham inventory.

It has been a year since we established our Johnson County Radio Amateurs Club " Comfort and Care" committee. In the past we have received word about a member such as a hospital stay after they have returned home. If you are willing to share this type on information please let Jay (WJØX) know.

There is only one meeting in November. Please join us on Friday November 13. We will have some information on our Christmas party for 2020.

Our thanks to Vince (KEØCGR) for all his time and work for the raffle this year. I know Vince would also point to Cal and Ted for with the Paypal and web site raffle support.

Thanks to all members that volunteered at Ensor. Your name is in the hat for the gift certificate. Also thanks to Ted for his work with the scheduling volunteers.

I hope everyone has a safe and Happy Thanksgiving.

– Bill Gery – WA2FNK

Johnson County Radio Amateurs Club - October 9, 2020

Meeting Date: Friday October 9, 2020. The meeting Started at 7:00 PM.

Attendance: Due to COVID-19 restrictions, this Meeting took place online using Zoom Video Conferencing. 31 were present.

The Minutes from the September 25, 2020 were read and accepted unanimously.

The Treasurer's report was unavailable.

Old Business:

- No 1st time visitors to the meeting.
- Repeater Update – Bill Brinker, WAØCBW, reported all working well. The 145.290 MHz Repeater antenna U bolts still have not been replaced yet.
- Ensor Auction – Raffle tickets are available to purchase off the website or from Vince Sabia, KEØCGR. The final drawing will be Friday, October 23, 2020 for $400. Funds from the raffle will be shared with the Ensor Museum.
- Ensor Museum Volunteers – October is the month that the JCRAC provides volunteers to staff the Museum on Saturdays and Sundays from 1pm to 5pm. Please sign up for a slot by accessing the link on the Club's website. Like previous years, all volunteers that sign up will be entered into a drawing for a $50 Gift Certificate to Associated Radio. Volunteer multiple times and you will be entered multiple times. Volunteers are covered for 10-10 and 10-11 but needed for other times.

New Business:

- No new business.

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 4 participated on October 7.
- 40m SSB Roundtable – 4 participated on October 8.
- Fusion Digital 440 net – NR
- 2m Wheat Shocker net – NR
- HF Activity – Jamie – ABØAB 20 m Eastern Europe, Russia and Sweden, CW Ops Contest; Jay WJØX, reached Belize and has a new ICOM 7610

Announcements:

- WW1USA Remote Special Event October 31st. Charlie, NØCVW, is looking for 2-3 more stations. Will operate CW, SSB and FT-8.
- Campfire at Ensor Museum, Saturday, October 9th.
- See Larry's List for upcoming Events.
- Bill KA2FNK indicted that the FCC has removed the 3 GHz band from the Ham Radio spectrum, there is concern that 5 GHz will also be affected. 3GHz and 5 GHz are good spectrum for Mesh Networks
- Howard NØAZ announced that the Mid-America Antique Radio Club is having an auction, Saturday, October 9th at Ensor Museum
- Brazil is proposing to eliminate ham radio examinations.

Business meeting adjourned at 7:30 PM.

Program:

The Program was a presentation on the "Message Handling and ARRL Radiograms" by Bill Gery, KA2FNK.

Submitted by Diana Fiddick, KDØOBP for Ted Knapp, NØTEK, Secretary.

Johnson County Radio Amateurs Club - October 23, 2020

Meeting Date: Friday October 23, 2020. The meeting Started at 7:00 PM.

Attendance: Due to COVID-19 restrictions, this Meeting took place online using Zoom Video Conferencing. 34 were present.

The Minutes from the October 9, 2020 were read and accepted unanimously.

The Treasurer's report was unavailable.

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – Bill Brinker, WA0CBW, reported all working well. The 145.290 MHz Repeater antenna U bolts still have not been replaced yet.
- Ensor Park and Museum Manager Larry Woodworth, W0HXS retired this summer. This Saturday, October 24th, Larry will be presented the 2020 Silver Eagle D-104 Microphone Award from the Mo-Kan Regional Council of Amateur Radio Organizations, A City of Olathe Certificate of Appreciation, and A Letter of Commendation for his years of service to the Community from Olathe Mayor John Bacon.
- Ensor Museum Volunteers – October is the month that the JCRAC provides volunteers to staff the Museum on Saturdays and Sundays from 1pm to 5pm. Please sign up for a slot by accessing the link on the Club's website.

New Business:

- Ensor Auction Raffle – The Fourth and final drawing for a $400 Gift Certificate to Associated Radio was conducted. Greg Wolfe, KI0KK was the winner. Vince Sabia, KE0CGR reported that 113 books of tickets and 5 single tickets were sold. He will submit a final report to the Club.
- Plans are under way for this year's Club Christmas party. Stay tuned for more information.

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 5 participated on October 22.
- 40m SSB Roundtable – 5 participated on October 21.
- Fusion Digital 440 net – 19 Check-ins on October 21 and 15 Check-ins on October 14.
- 2m Wheat Shocker net – 12 Check-ins on October 22 and 13 Check-ins on October 15.
- HF Activity – Svalbard 20m SSB, 20m and 40m are good to Spain and Portugal during mid-day.

Announcements:

- WW1USA Remote Special Event October 31st.
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:50 PM.

Program:
The Program was a presentation on "20 m Vertical Antenna Modeling using EZNEC" by John Raydo, K0IZ.

Submitted by Ted Knapp, N0TEK, Secretary.

A Hambone Story - Jaimie Charlton, ADØAB

Hambone and the Thunderbolt

"Geez, Hammy, that was a dumb idea! Now we're stuck here. I mean, really stuck here!" admonished Dude, Hambone's younger brother as their friends, Joey and Tim, looked on trying to avoid being sucked into the battle.

The idea for this trip was spawned during one of Hambone's fraternity's Friday afternoon pizza and beer parties. At first the group was enthusiastic about a trip to the mountains. But as the reality of sleeping and cooking as well as taking care of other basic necessities outside in the wild began to sink in, most of these boys found reasons to back out of the trip. In fact, only Tim, Hambone's friend and a really smart engineer remained. Of course, Dude and his pal Joey invited themselves along.

Still, Dude had a point. The boys were spending spring break camping in the Rocky Mountain National Park. They left Estes Park a couple of days earlier in Joey's old jeep and kept following trails ever higher into the mountains. But now they were lost and the jeep's battery was dead.

"Shut up, Dude! Yesterday, you thought putting my HF rig in the car was a great idea when we were talking to Uncle Elmer on it. Didn't he, Tim?"

"Guys, leave me outta this. When you get done fighting, maybe we can figure something out," replied Tim backing away from the display of brotherly love. But Dude wasn't ready to stop.

"When you said you were bringing an HF rig I thought you were talking about that little QRP backpacking rig you got. Or maybe something like this two-meter handie talkie", said Dude waving Tim's battered up FT60 around. "I didn't think you'd bring that clunky monster in a crate."

"That HT hasn't worked out very well, has it? Who knew there wouldn't be any repeaters scattered around the mountains where nobody lives? Besides, this is not a monster in a crate," shouted Hambone hugging the wooden box that housed his homebrew transceiver. "This is an almost exact replica of the famous paraset radios that Allied spies used to transmit information back to England during World War Two. It's got three tubes that were hard to find and a vibrator power supply which was even harder to find. It takes a lot of power to run this stuff. This is a real piece of history, sort of."

"Okay, but now we're screwed. You forgot to turn the stupid thing off and now it's drained the jeep's battery and we're stranded here in the middle of nowhere with a car that won't start. It's a piece of history all right. Just like the fun in this trip."

"Okay guys, step down and take a deep breath!" shouted Tim as Dude tried to wrench the box out of his brother's grasp.

"Tim's right, we've got to work together and make this our campsite," said Hambone trying to take charge. "It's already getting cold so we should be getting our big tent set up.

Joey, Dude, you guys set up the tent and build a fire to help keep us warm while Tim and I unload the rest of our gear."

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"I'd like to speak to Professor Erlenmeyer Flask, please."

"This is he speaking."

"Oh hi, Early. This is Elmer, how's it going?"

"Great, Elmer, how about you?"

"Livin' the dream, thanks for asking.

Did you know that Hambone and a couple of other guys were going to spend spring break camping in the Rocky Mountain National Park?"

"Yes. He was showing off a tube transceiver he made and said he was going to try it out on a camping trip in the mountains. Since we are a bit short of mountains in Kansas, I figured he was going there."

"Well, he, his brother Dude, Joey and Tim did go. I heard him on the air doing his Parks On The Air thing. He said they had no cell phone coverage and they were having some problems. But his signal faded before he could tell me exactly where they were. I'm getting a bit worried because they were due home yesterday.

see HAMBONE on page 6

from HAMBONE on page 5

"Did he say anything in class about his intended route?", asked Elmer.

"Not exactly. He was trying to recruit some of the other students to go along. He said that there's a small hotel at the foot of the trail where they would meet. He did say that they wouldn't have to pay the park's thirty-five dollar entry fee because he knows how to sneak in."

"That's great," sighed Elmer. "That means they are not registered with the ranger station so the Rangers don't know they're there. I guess I'd better go and look for them. It'll be like looking for a needle in a haystack."

"I suspect that they are just having a good time," said Professor Flask. "But if they're not, maybe I can help."

"How's that?"

"I've been working on this World War Two radio direction finder. It was developed by the Germans to find those spy radios like the one Hambone build."

"How will that help?" asked Elmer. "Apparently Hambone's transceiver stopped transmitting."

"You know, the first spies transmitted long detailed messages that allowed the Germans to find them by triangulation. That turned out badly for those spies. So, the use of short, coded messages became the norm. That, combined with a bit of frequency hopping, stymied the Gestapo. The spies figured they were safe and they continued to use coded messages that they transmitted to Bletchley Park in the UK on a random schedule.

Those transceivers were really a two-tube regenerative receiver and a single tube, 4-5 watt transmitter in a wooden box that seems huge by our standards, but they were considered tiny back in their day. That made them relatively easy to conceal under a floor or in a recess behind a picture. They were usually located in basements or rooms without windows where they could be operated without fear of being watched.

Being caught with a transceiver was a life-shortening experience. But I don't think Hambone has to worry."

"Okay, okay, Early, enough with the history lesson. What does all that have to do with finding the boys?"

"Gees, sorry, Elmer. I thought you'd like a little background."

"I do, but the boys may be in trouble. I don't know about Tim and Joey, but Hambone and Dude have no camping experience. Their idea of outdoor living is a poolside room at the Marriott."

"Okay, Elmer, I hear you. Here's the thing. Although the spies had won round one of the clandestine radio battle, the Germans weren't out of the game. They came up with a device they called the Thunderbolt which could find radios even when they were turned off."

"I've never heard of such a thing, how did it work?"

"Pretty simple, really. It was based on the fact that although the spies hid their radios, they usually left their stealth antennas connected. The Thunderbolt transmitted high power RF pulses on the spy radio frequencies. The pulses were picked up by the antenna and caused it and the associated tuned circuits in the radio to resonate, or "ring", and re-radiate a small amount of that signal. A super sensitive receiver picked up the re-radiated signal allowing the Gestapo to locate the radio even though it was not turned on."

"That's amazing!" exclaimed Elmer. "I bet that ended the careers of a lot of spies."

"It really didn't because it was a big, clunky device and the war ended before very many could be produced.

I have one here that is almost a pile of junk. But I managed to duplicate its operation with an SDR transceiver and a pulse amplifier. With it, I can find my transmitter from almost two miles away. Maybe we could throw it in the car and use it to find the boys, if Hammy hasn't taken down his antenna."

"I'm sure his antenna is still up. Hambone is a firestorm of energy when it comes to building something, but not so good at take-down and cleanup afterwards.

Anyway, I'll be right over so we can get started. It's a long drive."

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"That was really stupid, now we don't even have a tent!" hollered Hambone. How could both of you be so dumb?"

"How could you be so dumb," retaliated Joey mocking Hambone's tone. "I suppose sneaking into the park to avoid paying a few bucks so now the rangers don't know we're here and in trouble and running the car battery down so we can't even call for help were brilliant moves!"

"They were honest mistakes!" shouted Hambone. "Burning down the tent is a whole different level!"

see HAMBONE on page 7

from HAMBONE on page 7

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"Hold it a second, Elmer, I think we got a ping. Yup, there it is," cheered Erlenmeyer carefully turning his directional loop antenna. "It's either directly in front, or in back of us."

"I'd guess it's in front because we didn't hear it when we were back there," said Elmer stepping up their speed to the top of the next knoll.

"The ping is getting stronger," added Early, "And the scanner is picking up something, too. It sounds a little like somebody's calling CQ and mayday."

With no time to lose, Elmer put the pedal to the metal and the jeep clawed its way up the next rise faster than any jeep had done before. As they cleared the top, their eyes were greeted by a most beautiful sight. Before them lay a burned down tent, a small fire, a dead jeep, burned camping gear scattered around and a tall boy standing on a rock talking into what looked like a branch from a homemade tree.

"Unck, Professor Flask, are we glad to see you! Our jeep won't start, our food's all gone and we're lost. How did you find us?" Chorused the boys.

"Did you hear my signal?" asked Tim.

"We found you using this World War Two direction finder that Professor Flask made," explained Elmer.

"How did you do that, our transmitter is dead," asked Hambone.

Drifting into his professorial mode of speaking, Professor Flask continued, "This direction finder works on the same principle as ringing a bell. Do you know why after you hit a bell it continues to ring?"

"Yes, because it oscillates at its resonant frequency," said Dude.

"That's right. This direction finder is called the Thunderbolt and works on that same principle. It emits a short, powerful blast of RF on your transmitter's frequency. That blast causes the tuned circuit attached to your antenna to oscillate, or ring, and re-radiate some RF. This receiver picks up that RF. Your transmitter doesn't even have to be turned on."

"That's very cool!" exclaimed Tim. "Did you pick up my distress call?"

"We did. That antenna is very innovative, see me at school. I think I can arrange some extra credit for that."

The two men and four boys quickly cleaned up the campsite so that there was no sign they had ever been there, jump-started the dead jeep and headed for the nearest fast-food restaurant. You know Elmer was really relieved that they found the boys in good shape because he bought dinner for everyone.

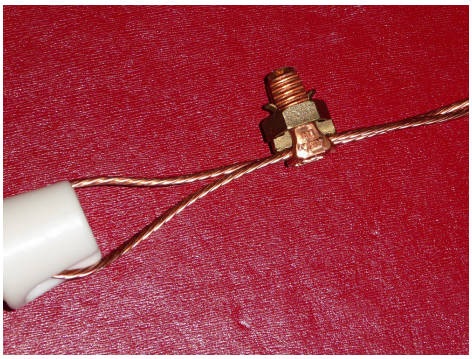
Something he rarely does.

>> JCRAC FEEDBACK <<

Raydo Recommends

John Raydo, KØIZ

Here's an old idea that might be new to some. When constructing a new wire antenna, it is wise to include an extra foot or two on each wire for adjustment to frequency. This has been found much easier than adding to a too-short length! An electrical connector called a "Split-Bolt" connector is perfect for temporary or even permanent wire adjustment. Pictured here is the end of a wire leg with about 18 inches doubled back and cinched down with a split-bolt. The smallest size for 16 ga and larger is best and available at most home centers.



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