

# FEEDBACK

DECEMBER 2020

## MEETINGS

**Dec 11 - Holiday Party**

**Dec 25 – No meeting – Merry Christmas!**

The Johnson County Radio Amateurs Club normally meets on the 2nd and 4th Fridays of each month at 7:00 PM at the Overland Park Christian Church (north entrance), 7600 West 75th Street (75th and Conser), west of the Fire Station.

Most months (not December) 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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	B	I	N	G	O
Card 8	Frosty the Snow Man	Coventry Carol	Away in the Manger	Santa Tell Me	Joy to the World - Mariah Carey
Card 8	Last Christmas	Little Saint Nick by	Buon Natale	Do They Know It is	God Rest Ye Merry

## JCRAC Christmas Party – December 11



Herb, NZØF and Diana KDØOBP Fiddick have organized a “Christmas Music Bingo”. Ask the Fiddicks for a bingo card (one per person) at [hfiddick@gmail.com](mailto:hfiddick@gmail.com) before noon on Friday, December 11th.



## **-> FEEDBACK <-**

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

**Bill Gery, KA2FNK, President**

**Jaimie Charlton, ADØAB, Vice President**

**Ted Knapp, NØTEK, Secretary**

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## **Thank you, FEEDBACK contributors**

*Although 2020 has, in many respects, been an unusual year, the FEEDBACK has once again been the beneficiary of the generosity and hard work of several talented club members.*

*Although Tom Wheeler, NØGSG's dazzling technical expertise graces the pages of many technical publications, he always finds time to share a project with the JCRAC.*

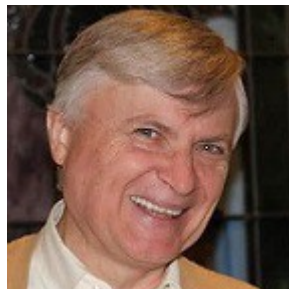
*John Raydo, KØIZ shares tech tips on a broad range of topics.*

*President Bill Gery, KA2FNK and Secretary Ted Knapp, NØTEK make their contributions each week.*

*And then there's Jaimie Charlton, ADØAB, who, each month, in his inimitable lighthearted way leads Hambone, and me, and perhaps some of the rest of us, one step closer to understanding how these magical boxes communicate with other magic boxes around the world.*

*Thanks, guys.*

*Chip Buckner, ACØYF*



## **PRESIDENT'S CORNER**

This year has presented quite a few challenges. I know the year 2020 is one that I'll remember. It also brought to mind the conversation that I had with my parents about the Spanish flu. Both were not quite in their teens, and were aware of what was occurring. Yes, things did return to normal.

I hope everyone enjoyed a safe and Happy Thanksgiving. We had a Zoom Thanksgiving. The food item that was missing was the mincemeat pie. I'll correct that at the future. Another thing that was missing was the leftovers.

Kyle (WQ0G) reports that the "drive by" Fox Hunt was a success. He is planning another in the next few weeks. The hunt was a great idea, thanks Kyle for organizing.

The Club's Zoom Christmas party will be December 11. Diana has worked on the entertainment for this year. So have your favorite beverage in hand and some snacks within reach.

I want to extend everyone a Merry Christmas.

**- Bill Gery - KA2FNK**



## ***Johnson County Radio Amateurs Club - November 13, 2020***

Meeting Date: Friday November 13, 2020. The meeting Started at 7:00 PM.

Attendance: Due to COVID-19 restrictions, this Meeting took place online using Zoom Video Conferencing. 38 were present.

The Minutes from the October 23, 2020 were read and accepted unanimously.

The Treasurer's report was read and accepted unanimously.

### Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – Bill Brinker, WA0CBW, reported all working well.
- Bill Gery, KA2FNK reported that Gary Adams, KC0TFR was recently taken to rehab center after being in the hospital.
- Mike Bellinger, K0UAA Missouri ARES District Emergency Coordinator and coordinator of public service events that the Shawnee Mission Park sponsored became a Silent Key.
- JCRAC Annual Christmas Party December 11, 2020. Due to Covid-19, we will not be having an in-person gathering. Instead we will be having a "Christmas Music Bingo" activity via Zoom. Herb and Diana Fiddick are organizing this event and details will be available soon.

### New Business:

- Ensor Museum October Volunteer Drawing for a \$50 Gift Certificate to Associated Radio – Winner was Bill Gery, KA2FNK. Also, the City of Olathe does provide the Club a Stipend for providing volunteers to the Museum in May and October.
- Ensor Auction Raffle – Vince Sabia, KE0CGR reported a Net profit of \$1,292.13 which will be split 50/50 with the Ensor Museum and the Club.
- Ted Knapp, N0TEK as an employee of Hallmark Cards, Inc. has the opportunity to participate in Hallmark's Volunteer Program. The purpose of the Volunteer Program is to recognize Hallmark employees who have volunteered a minimum of 50 hours of service to a non-profit organization in a one-year period. As the club's Secretary and having met the non-profit qualification, the Hallmark Corporate Foundation has made a contribution of \$400 to the Club.
- Plans are under way for this year's Club Christmas party. Stay tuned for more information.
- WW1USA Special Event commemoration Veterans (Armistice) Day took place on October 31<sup>st</sup> and November 11. A total of 2,444 contacts were made between both days.

### Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 4 participated on November 12.
- 40m SSB Roundtable – 4 participated on November 11.
- Fusion Digital 440 net – 18 Check-ins on November 11 and 21 Check-ins on November 4.
- 2m Wheat Shocker net – 13 Check-ins on November 12 and 19 Check-ins on November 5.
- HF Activity – Cuba, South America, Africa, 8J1RL Japanese Antarctica Research Expedition.

### Announcements:

- Skywarn Recognition Day December 4<sup>th</sup> at 6pm to December 5<sup>th</sup> 6pm. This will be the 21<sup>st</sup> year. More details to follow.
- Breakfast Club – As winter approaches it becomes harder to meet in the park. Also, indoor participation at the IHOP (91<sup>st</sup> and Metcalf) is not comfortable for some. So, look for some changes coming soon.
- Johnson County Community College's amateur radio club is official.
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:52 PM.

### Program:

The Program was a presentation on the "Most Accurate Clock Project" by Tom Wheeler, N0GSG.

Submitted by Ted Knapp, N0TEK, Secretary.



## Hambone Gets Trapped

“Hi Hammy, I haven’t seen you around here in the Student Union for a while. Anything exciting happening?”

“Oh, hi Professor Flask. Nothing exactly exciting. I’ve got some antenna problems that me and the guys at the frat can’t figure out.”

Suddenly taking an interest at the sound of the word antenna, Professor Erlenmeyer Flask asks, “What sort of problems?”

“We were taking turns working that special event that the museum people put on where we use some cool call letters and make a lot of contacts with people who want that cool call on a QSL card when our antenna burned out. We don’t know why and we can’t seem to fix it.”

Flask, who had had little to do over the last few weeks now sensed a radio mystery, and he loved mysteries.

“Whoa Hammy, you’re getting ahead of me. What antenna are you talking about and what exactly do you mean by ‘burned out’?”

“Remember when I bought that ground-mounted vertical with the traps at that hamfest and we installed it at the frat house?”

“Sort of,” said Professor Flask in a non-committal manner. “I sort of remember you boys talking about some new antenna or other.”

“We got it all installed with ground radials and everything and I was making CW contacts on forty-meters using it for a couple of hours

and then I switched to twenty-meters. After a few contacts and suddenly right in the middle of



answering a guy, the high SWR alarm on our tuner started beeping, our amp flashed HIGH SWR in big red letters and shut down.”

“What did you do?”

“Nothin’, that was our only twenty-meter antenna and the other bands were dead so, we were dead, too.”

“I mean how did you determine that you burned out your antenna. That sounds a bit strange to me. The burned part, I mean.”

“At first,” continued Hambone, “We thought we had some sort of problem with our amp, but it seemed to be okay when running into a dummy load. Then we thought maybe our antenna switch had gone bad again. We had that happen before. But when we connected the antenna direct, no switch, the problem was still there. Other antennas and even that vertical worked on ten and fifteen meters.

After checking all the cables we finally came to the conclusion that the vertical antenna had to be the problem.”

“But you said that the vertical worked on higher frequency bands, didn’t you?” asked the professor.

“Yes, but that antenna was the only thing we hadn’t fully checked. We took it down and removed the twenty-meter trap. When we opened it we saw that the coil was badly burned. Some of the turns

were actually fused together.”

“It sounds like you found the problem,” said Flask, somewhat disappointed at the simple, obvious cause. “What’s the mystery?”

“There’s a couple of things we don’t understand. The first is why’d it burn out? The advertisements say the antenna is good for 1500 watts CW and SSB. We were not running more than 1200 watts, max.”

“I don’t know about that particular antenna, but my experience is that ham equipment, especially RF items like antennas, tuners, baluns, switches, often under perform their specs. If you want it to work right, you’ve got to buy bigger than you think you will need.”

“That’s what we thought, so we decided to repair the trap by rewinding the coil with heavier wire.

The factory coil was wound with 31 turns of #14 magnet wire. We removed the burned wire, cleaned up the fiberglass core and rewound the coil with 32 turns of #11 magnet wire. I put one extra turn so we had something to trim if we needed it. We reassembled the antenna and stood it back up only to discover that twenty-meters still had high SWR and 40 and 80 were very bad, too. We don’t know why it doesn’t work. I guess we’ll have to buy a replacement trap.”

“Before you do that, think about how this trapped vertical is supposed to work,” said Professor Flask as he settled down placing his tall double latte on an unoccupied table. Hambone knew he was in

**see HAMBONE on page 5**

<p><i>from HAMBONE on page 4</i></p> <p>for a long story because it was well-known that double lattes gave Flask amazing staying power. Just one could keep him going for at least an hour, maybe longer. To make matters worse, he took out a mini-yellow pad and marking pens from his jacket pocket.</p> <p>Set now for the long haul, Flask started to sketch, “This is your antenna mounted on the ground with some ground radials. Starting at the bottom, the first piece of tubing, called the first section, is your ten-meter radiator with the ten-meter trap at the top.”</p> <p>“I get that,” said Hambone. The trap is a parallel LC circuit with a very high impedance at its resonance at ten meters. It stops any ten-meter power from continuing up the antenna. So, any ten-meter signal ‘thinks’ the antenna is only as tall as the first section. The trap, however, lets other lower frequencies through because it has a very low impedance at other frequencies.”</p> <p>“Right you are. Continuing on up the antenna, the section of tubing above the ten-meter trap, along with the first section, form the 15-meter part of the antenna and it is topped with a parallel LC trap tuned to fifteen meters.</p> <p>Notice that the fifteen-meter portion of the antenna is composed of both the first and second sections of tubing. This is because the ten-meter trap only blocks ten-meter signals, it lets the fifteen-meter and other frequencies through.</p> <p>Next, comes the third section which is topped by your twenty-meter trap. This works the same as the others in that all three sections comprise the twenty-meter portion</p>	<p>of the antenna and the twenty-meter trap blocks the twenty-meter signal from continuing on up. Of course, like the other traps, the twenty-meter trap only blocks the twenty-meter frequencies. It lets lower frequencies through because the antenna spec’d for thirty, forty and eighty-meter operation.”</p> <p>“I understand all that,” said Hambone. “Each trap acts like a switch which cuts off the upper sections so each lower section is more or less resonant in its own band. But the switch passes the lower frequencies making the antenna seem like it’s the right length for each band.</p> <p>So, why doesn’t our rebuilt trap work?”</p> <p>“I’m getting to that,” said the professor. “When you rewind the coil in the twenty-meter trap with heavier wire, you used the same number of turns, but you made the coil longer. From your pictures, it seems the original coil was about two inches long and yours is three.”</p> <p>“Sure, because the heavier wire took up more space, but the number of turns is the same,” countered Hambone.</p> <p>“The number of turns may be the same, but since the total coil is longer, it’s inductance is lower. Here’s the formula for calculating the inductance of small coils:</p> $L = a^2 n^2 / (9a + 10b)$ <p>Where:</p> <p>L = inductance in microhenries</p> <p>a = core radius in inches (0.5” in this case)</p> <p>b = core length (2.04” for the original coil; 3” for the new coil)</p> <p>n = number of turns (31 turns for the original and 32 turns for the new coil)</p>	<p>Plugging in your numbers for the original coil with a length, b, of two inches, we get <math>L=9.65</math> microhenries.</p> <p>But plugging in the numbers of the new coil, which are the same except for the length being three inches, we get <math>L=7.42</math> microhenries. That’s a lot less which means...”</p> <p>“I get it! That means the trap is tuned to a much higher frequency which is why it didn’t work,” announced Hambone, triumphantly. “Now I’ll just increase the trap’s capacitance until the SWR is down where it should be and we’ll be good to go. Thanks, Professor!”</p> <p>“Wait, there’s more,” said Professor Flask.</p> <p>But Hambone had already jumped up from the table and was out the door confident he had the fix for his antenna.</p> <p>****</p> <p>The next day, a significantly less confident Hambone appeared at the door to Professor Flask’s office.</p> <p>“Good morning, Hambone. Come in. What can I do for you?” asked the professor brightly pretending that he had no idea why Hambone was at his door.</p> <p>“You know that antenna trap we talked about in the union yesterday? I did as you said and that trap tuned up okay. But ...”</p> <p>“But what?” asked the professor, still feigning naivete.</p> <p>“But, the rest of the antenna is all out of wack. The bands lower than 20-meters, that is, 30, 40 and 80 are all out of tune now. Why is that? I know you said that there was more yesterday, but I wanted to get started,” confessed Hambone</p> <p><b><i>see HAMBONE on page 6</i></b></p>
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**from HAMBONE on page 5**

sheepishly staring down at the trap he held in his copper colored hands. It seems that copper grease gets on everything.

“There’s a lot more to be said about multiband trap verticals, but the problem you’re seeing is because the traps don’t work the way you think they do,” said Flask.

“What do you mean? I thought they just turned on and off various parts of the antenna depending on the frequency.”

The professor continued, “The traps do confine RF power to specific parts of the antenna based on their resonant frequencies. However, it’s what they do off-resonance that’s giving you problems.”

“Don’t they act like switches?” asked Hambone.

“No. Think about it. At resonance, each trap blocks the RF from going past it. That’s why the highest frequency trap, ten-meters, is the first trap and nearest to the bottom of the antenna. As the frequency goes down, the traps are arranged so that the antenna appears longer and longer.

At ten-meters, that first trap blocks the RF from going up the antenna past the first section and that much of the antenna appears to be resonant at that frequency even though the actual antenna is much longer.

But, at lower frequencies, well below the resonant frequency of the trap, the trap is still in the circuit and appears as an inductor.”

Hambone looked puzzled, so the prof continued.

“You said you understood that, at their resonant frequencies, the traps had high impedances and blocked

RF at those frequencies, but they had low impedances at frequencies below resonance and passed the lower frequencies.”

“Yeah, isn’t that what you said in class?” asked Hambone.

“Almost. The trap’s impedance is much lower at frequencies below its resonant frequency, but it is not like a switch. It is like an inductor.”

“Yes. You might remember that we went over that in class last semester.”

“Yeah, I do, now,” responded Hambone hoping to change the subject. “But I put the same number of turns on my coil and tuned it to resonance just like the original. I don’t see why there is a problem.”

“Yes, you put the same number of turns, but because your coil is longer, its inductance is lower than the original coil. You then tuned the trap to resonance by increasing the parallel capacitance. That’s why it blocks 20-meter RF properly. But at lower frequencies, the inductance of your homemade coil is still too low.

Think about it. Each physical section of the antenna is really too short for its intended frequency band. But it works because each trap below it acts as a loading coil. It’s the same as the loading coil you put at the base of a short whip antenna on your car to make it resonate at, say, twenty meters.”

“Oh, I never thought the traps were like loading coils. I think I get it now, but why aren’t the ten and fifteen-meter bands affected?” asked Hambone.

“That’s easy. Because their traps block the ten and fifteen-meter power respectively, that RF never

makes it to the twenty-meter trap. Therefore, it doesn’t affect those bands. But it’s a different story for the thirty, forty and eighty-meter bands.

Since those frequencies are all below the twenty-meter resonant frequency of your homemade trap, it looks like an inductor, or loading coil, to them. A loading coil that’s too small. The result is that the part of the physical antenna above the twenty-meter trap looks somewhat like a capacitor with a series resistor.”

“It just gets worse and worse,” moaned Hambone.

“Not at all, you just have to do is make each of those sections a little longer that it is now. Work on the thirty-meter section first because it is the one just above the twenty-meter trap. Gradually increase the length of that section until it gives its lowest VSWR at the frequency you want. Then do the same for the forty and eighty-meter sections. It will be a lot of work, because the adjustments are critical and the VSWR measurements must be made with the antenna in place, but you can do it.”

“Thanks Professor Flask! But one last question, how does making the antenna longer make its capacitance lower?”

“Hambone, antennas are one of the most complicated and least understood elements in radio. Most of what you hear is only partly correct or just plain wrong. We will scratch the surface of antenna theory next semester. But for now, just accept it and fix your antenna.”

**>> JCRAC FEEDBACK <<**

A Check-in from St. Nicholas - Deb Buckner, KDØRYE

*as presented at the 2019 JCRAC Christmas Party*

'Twas the night before Christmas, and, down in the shack,  
I was running the Net while enjoying a snack;  
The check-ins were few on this holiday night  
And those on the air kept the chat fairly light;

There was talk of equipment, transceivers and more,  
that all could be found at the radio store;  
And talking of food to be eaten tomorrow,  
And whether a newbie should buy, beg or borrow.

When over the air in the midst of our chatter  
There came a distress call--a serious matter.  
I yielded the Net to a voice sounding sick:  
"N P zero One, the name here is Nick."

"'You don't need a map,' the elves told me this year.  
'We put a new GPS-thing in your gear!;  
But now I am lost! I don't know where I am,  
And I think I'm in need of the help of a ham."

"Don't worry, Santa, we know what to do."  
"We'll send all our spotters to watch out for you"  
"N Zed Zero F, I relinquish the net."  
"N Zed Zero F", Herb responded, "You bet".

"Now, Bill, and Now, Vince, Now, Diana and Joe!  
Ed, Ted, and the rest, call the others you know!  
Get out to your posts, Alpha 1, Bravo 6,  
Our mission tonight is to rescue St. Nick!"

Then into the night the hams sped to their places,  
but safely, as mandated, always, by RACES.  
The spotters checked in, Charlie Five, Delta Eight.  
The only thing now we could do was to wait.

And after a silence, I heard on the Net,  
"Net Control, Alpha 1; there's no sign of him yet."  
There came more reports. I heard each spotter say  
he saw no sign of Santa, his deer, or his sleigh.

"N P zero one, I'll re-check," Santa said,  
"The answer is flying in front of my sled.  
QRP, you can't see, there is barely a glow,  
Come on, Rudolph, crank it up, go QRO."

"So, Herb, tell your spotters to look for red light,  
His radiant beacon was never so bright.  
Your spotters will surely find me in the sky.  
N P zero one, it's St. Nick, standing by."

"Now, spotters", Herb called out, "don't anyone leave.  
"We're going to find Santa, you have to believe."  
You're looking for Rudolph and his bright red light.  
Keep watch, let's get Santa Claus back on his flight."

"Alpha 2, I can see it. A little red dot,  
It's out to the north, oh, yes, I know the spot.  
There's Santa, the reindeer, I'll tell you what's more,  
He's over our very own radio store."

Now, back on the Net, Herb said, "Santa, you're found,  
If you will guide all of your reindeer straight down,  
And pick up some goodies, you know what to get,  
For all of your ham friends right here on the Net."

Hearing static, I woke. I was still in the shack.  
It was all just a dream. I was taken aback.  
Then I heard a loud voice, coming over the air,

"Thanks! Merry Christmas to hams everywhere!"