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

FEEDBACK

SEPTEMBER 2019

Continuing Education: Raspberry Pi in Amateur Radio

Bill Gery, KA2FNK continued his occasional series on using the Raspberry Pi microcomputer in amateur radio projects.

Gery suggested that a beginning Pi-user should use the Pi to decode data modes, such a RTTY, PSK and CW.

Moving up in complexity, Gery speculated that the combinaiton of a Pi, a USB soundcard and an RTL radio receiver USB dongle running freely available SDR# software might constitute the least expensive software defined radio receiver..

With a bit of programming (and, ideally, a low pass filter), the Pi can become a 10 mW Weak Signal Propagation Reporter (WSPR) transmitter..

The easiest Pi project, Gery suggested, might be to install GPredict software to set up a satellite tracking system. The next--albeit substantially more complicated--step would be to interface the Raspberry Pi with an antenna controller to track satellites in real time.

Gery's fifth project turned the Pi into a digital voice hotspot for D-STAR, Fusion and DMR networks. The Pi, Gery pointed out, made the connection from RF to the Internet, irrespective of the presence or absence of local repeaters.

The sixth project turned a Pi into an Automatic Packet Reporting System (APRS) tracker.

The addition of PiAware software allows the Pi to track Automatic Dependent Surveillance - Broadcast (ADS-B) flight tracking information.

Gery said that he had read about experimenters using a Pi to control antenna rotators.

Project number nine rand the EI4DI contest logging software.

Once the radio work is done, Gery concluded, a Pi can act as the brain of any of a number of all video arcade games.

Gery provided web references for most of the projects and posted his slides on the club website. Look for the link to his "Raspberry Pi for Amateur Radio Presentaitons-Part 2".

SEPTEMBER MEETINGS

***Sep 13** -- Show and Tell - Bring any project you are working on*

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***Sept 27** – TBA*

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.

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 SOIC ON YJC

IN THIS ISSUE

-> FEEDBACK <-

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

Bill Gery, KA2FNK, President

Jaimie Charlton, ADØAB, Vice President

Ted Knapp, NØTEK, Secretary

Cal Lewandowski, KCØCL,Treasurer / FEEDBACK distribution

* * *

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All email addresses are available at w0erh.org

Please Welcome our August First-Timers

Top: Member Kevin (K9GRP) and newcomer Donna (Field Day licensee KEØWDK) Van Der Does. Lower left: Bob Kelly (KEØVCC) earned his ticket in March. Lower right: Susan and Lillain Durrie.

PRESIDENT'S CORNER

With September here, summer 2019 is rapidly coming to an end. I hope that the coller temperatures let you

completed that outside project you have been putting off. I have several antenna maintenance tasks. One task is some tree trimming as limbs have grown into the antennas.

A few big public service events occur each September. Try to find the time to volunteer for at least one of these events. Look up Larry's List for the events .

The JCRAC provides volunteer tour guides for the Ensor farm and museum. Ted will be passing around a sign up sheet. It takes only a few hours on a Saturday or Sunday so please pick a time and come help out.

Speaking of Ensor, auction planning and other activities are under way. The events will start Friday, October 25. The auction starts at 11 am Saturday, October 26. There will be also prizes, including a gift certificate for Associated Radio. We will need help Friday afternoon moving donated items to Ensor. This is a great time to look through your shack for that items looking for a new home.

– Bill Gery – WA2FNK

Johnson County Radio Amateurs Club - August 9, 2019

Attendance: Self introduction with name and call sign. 32 signed the check in sheet. This was followed be the Pledge of Allegiance.

The Minutes from the July 26, 2019 meeting were read and accepted with 1 opposed vote.

The Treasurer's report, as follows, was read and accepted unanimously.

Cash on Hand	$ 130.00	Repeater Operating Reserve	$ 1,417.83
Checking Account	$ 177.17	Memorial Fund	$ 310.00
Savings Account	$ 11,811.62	Active Members	144
PayPal Account	$ 86.49		
Total	$ 12,205.28		

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – All are working well.
- Ensor Auction will be October 26th. Vince Sabia, KE0CGR is in charge of the Raffle again this year. If you would like to help please see him.

New Business:

- Kansas State ARRL Convention in August 2020 is looking for a new home. A brief discussion was held around the possibility of the Club hosting it. Bill Gery, KA2FNK reported that there is not much, if any, information available around the financial impact from past conventions. Further discussion will happen at a later date when more information becomes available.
- A suggestion was made to possibly partner with the Santa Fe Trail Amateur Club to have an Amateur Radio booth at next year's Johnson County Fair.

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 2 participated on August 8.
- 40m SSB Roundtable – 4 participated on August 7.
- Fusion Digital 440 net – 13 Check-ins on August 7 and 15 Check-ins on July 31.
- 2m Wheat Shocker net – 12 Check-ins on August 8 and 9 Check-ins on August 1.
- HF Activity – Cyprus FT8 20m, St Paul Island CW 20m.

Announcements:

- Summer Breeze Bike Event August 25. See Herb Fiddick, NZ0F
- MS Bike Event September 28-29. See Herb Fiddick, NZ0F
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:33 PM.

Program:

- The Program for this evening was the Raspberry Pi - Part 2: "Amateur Radio Programs for the PI" by Bill Gery, KA2FNK.

Submitted by Ted Knapp, N0TEK, Secretary.

Johnson County Radio Amateurs Club - August 23, 2019

Attendance: Self introduction with name and call sign. 34 signed the check in sheet. This was followed be the Pledge of Allegiance.

The Minutes from the August 9, 2019 meeting were read and accepted with 1 opposed vote.

The Treasurer's report, as follows, was read and accepted unanimously.

Cash on Hand	$ 130.00	Repeater Operating Reserve	$1,422.83
Checking Account	$ 177.17	Memorial Fund	$ 310.00
Savings Account	$11,411.62	Active Members	144
PayPal Account	$ 125.03		
Total	$ 11,783.82		

Old Business:

- We welcomed all 1st time visitors to the meeting.
- Repeater Update – All are working well. Due to the Santa Fe Trail Amateur Radio Club losing the location for its Repeaters, we have given them permission to use our 220MHz Repeater for their nets. The same permission was given to the JoCo ARES group.
- Ensor Auction will be October 26th.
- There is no new information to share about the possibility of hosting the Kansas State ARRL Convention in August 2020.
- There is no new information to share about possibly partnering with the Santa Fe Trail Amateur Club to have an Amateur Radio booth at next year's Johnson County Fair.

New Business:

- A Board Meeting was held on August 18, 2019. Present at this meeting were Bill Gery KA2FNK, Jaimie Charlton AD0AB, Cal Lewandowski KC0CL, and Ted Knapp N0TEK. The following items were discussed:
    1. The image quality of the Projector is declining. Some options are fixing or replacing the current Projector or purchase a Projector for portable use.
    2. Memorial Fund – The money in this fund is designated for training purposes. Currently the Memorial Fund is comprised of money donated in someone's memory. We discussed the possibility of adding a percentage of the Ensor Auction proceeds to this fund. We also discussed the possibility of expanding the use of these funds to include scholarships. We would like to assemble a small team to oversee and further develop this idea.
    3. Membership Care – We discussed the idea of have a small team that would be responsible for the notification of the membership when "life events" occurred within the Club. Jay Greenough, WJ0X and Kevin van der Does, K9GRP have volunteered to develop this idea.
- A question was asked if the Club donated any money to this year's Kansas QSO party. Cal KC0CL reported that we donated $200 which is same as last year.

Reports:

- 6 m – NR.
- 10 m SSB Roundtable – 4 participated on August 22.
- 40m SSB Roundtable – 2 participated on August 21.
- Fusion Digital 440 net – 16 Check-ins on August 21 and 12 Check-ins on August 14.
- 2m Wheat Shocker net – 17 Check-ins on August 22 and 13 Check-ins on August 15.
- HF Activity – None.

Announcements:

- Campfire at Ensor Saturday August 24.
- Kansas QSO Party August 24-25
- MS Bike Event September 28-29. See Herb Fiddick, NZ0F
- Hawk 100 September 7-8. See Bill Gery, KA2FNK
- Warrensburg Amateur Radio Club Special Event Station October 31.
- See Larry's List for upcoming Events.

Business meeting adjourned at 7:37 PM.

Program:

- The Program for this evening was going to be presentation by Brian Short, KC0BS on "What is TV25" however he was stuck in Arkansas and was unable to attend the meeting. So Bill Gery, KA2FNK improvised with a Weather Service acronym guessing game.

A Hambone Adventure - Jaimie Charlton, ADØAB

Hambone Goes QRO

"It's here! It's here! Exclaimed Hambone as he ran to the door, flung it open and nearly tripped over two large boxes that Santa Clause, disguised as a UPS man driving his brown sleigh, had left on the step.

"Dude, give me a hand," he shouted dragging the first box over the threshold. "My new amp's here and these boxes are heavy."

What, you might ask, was the problem? Modern solid-state amps aren't all that heavy. Did Hambone go old-school and buy a boat anchor? No, he did not. But upper body strength is not an attribute enjoyed by most geeks like Hambone. Nevertheless, his younger brother, Dude, was there to help.

With the boxes safely in the living room, the boys tore into them. But the boxes proved tougher than expected and repelled the boys' attempt to invade and capture their contents.

Undaunted, the boys returned armed with their mother's best steak knives and launched assault number two. The boxes didn't stand a chance.

"This one's the power supply," observed Dude. "It's got a big-ass cable coming out of it."

"The amplifier's in this box," said Hambone as he tossed the cardboard aside revealing the shiny new charcoal gray box in all its pristine beauty.

"Just think, Dude, this amp opens up a whole new ham-world. No more wimpy RST 3-9 reports. No more waiting in pileups while rare DX stations work everybody else only to sign off before working me. Now, I'll be one of those 'you're a solid 5-9' stations that get answered on the first call. I will finally be able to run a frequency in contests without getting overridden. Just think, when I speak into the microphone, my voice will roll like thunder across airways," said Hambone, lovingly caressing his new amplifier.

"Nice," said Dude. "Maybe you and your amp should get a room.

One thing, though. I thought you said the amp tuned itself automatically. That knob there looks like a band switch to me."

"What the…" said Hambone. "It does look like a band switch. It's got 160, 80 40 etc. labels that look like ham bands."

"Maybe they sent the wrong amp."

"I don't think so, it looks just like the picture in the catalog," said Hambone. "It's probably okay, let's hook it up and try it out."

Their mother, following her motherly sixth sense, left the dinner she was preparing to see what her boys were up to. She arrived just in time to see Dude hauling the power supply and Hambone cradling the amplifier heading downstairs to their ham shack. "Be careful! That thing looks dangerous. Don't electrocute yourselves!" she warned with all the good intentions a mother can muster. Unfortunately, Mom saw danger in everything electrical so the boys had become numb to her warnings.

"Mom's such a worrier," said Dude. "Oh, wait, I think we left the manual upstairs. I'll go get it."

"Don't bother, we can figure out how to hook this thing up. All amps work the same," said Hambone. We just connect this coax from the transceiver to this "RF Input" connector on the amp and the antenna coax to this "Output" connector."

"The power is easy," added Dude. "I just plug this big connector into the amplifier and this power cord goes to the 240-volt wall outlet like that and we're all hooked up. Turn it on."

Hambone turned on the transceiver and then the amplifier. At first nothing happened, but a few seconds later the amp's meters lit up showing it had a full 55 volts of high voltage.

"That's not much high voltage. Shouldn't it be a couple of thousand volts?" asked Dude.

"It's okay, this is a transistor amplifier, it doesn't need very much voltage. It uses a lot of current, though," Hambone replied as he tuned to a clear spot in the voice part of the forty-meter band and selected lower sideband on his transceiver. He pressed the microphone button and uttered one word. That word was 'test'.

see HAMBONE on page 6

from HAMBONE on page 5

To both his and Dude's surprise, the amplifier just sat there with its meters glowing. But the transceiver's internal antenna tuner started clicking and buzzing madly trying to match the amplifier's input impedance which was 50 ohms.

Hambone shut the transceiver off. "Oh, I read somewhere that when you connect a transceiver to an amp you should put the transceiver's antenna tuner in bypass."

With the transceiver's antenna tuner in bypass and all switches on, Hambone once again pressed the mic button and spoke. To both his and Dude's surprise, nothing happened.

"There must be a loose connection," suggested Dude.

"Yeah," replied Hambone as he began tracing the coaxial cables.

"I'll check out the power supply and microphone," said Dude.

"OUCH!" shouted Hambone stumbling backward throwing down the coax connector he was holding. "Dude, you dummy, don't you know not to turn on the transmitter while I'm holding the antenna wire?"

"I, I'm sorry, I didn't know the power was on."

"What's going on down there? Are you boys okay?" Mom shouted in her I-told-you-so voice. "That electricity is dangerous, I'm calling your uncle."

Mom wasn't a ham or an electrician, but she knew what she knew and she knew electricity was dangerous. She knew better than to call the the boys' father because he would just side with the boys. No, she needed someone who could stare down that evil demon, electricity. She called Uncle Elmer. Who, conveniently, lived right next door.

She must have sounded desperate when she called because only minutes later the boys heard the heavy footfalls of their Uncle descending the basement stairs into their ham shack.

"Your mom says you guys are trying to kill yourselves," said Uncle Elmer. "Oh, nice new amplifier, Hammy. No more pipsqueak signals for you. How do you like it?"

"I'd like it better if it worked," said Hambone. We just hooked it up, but can't seem to get it to work."

"Well, let's have a look at it. Where's the manual?"

Dude piped up, "It's upstairs. Hammy said we don't need the manual. All amps work the same. Should I go get it?"

"Yes, please. I'm sure you guys do know everything, but it's a good idea to have a look anyway."

Elmer opened the manual to the 'Getting Started' section, "Well, look at that. You should be glad the amp didn't start, you've got some serious errors here. So, let's start over. Turn the amp off and pull the plug.

Look at this drawing here. It shows a dummy load connected to the amp for initial start-up. That's only common courtesy so you don't interfere with other stations while you're tuning up. I'd also put a power/SWR meter in the line so you can see that the amp is really putting out power. Otherwise, your only indication would be that the dummy load gets hot." Grudgingly, Hambone dug out an old SWR meter and connected it and the dummy load to the amp.

"This is why the amp didn't start when you keyed your mic," continued Elmer. "The drawing shows a cable from the transceiver to the relay jack on the amp. You have to short that jack to ground to switch on the amp. Otherwise, it stays in bypass allowing signals from the antenna to go directly to the receiver."

Hambone had already dug out the operating manual for his transceiver and found the same general drawing for connecting an amp. "It says here that not all amplifiers will need this connection. Some switch on when they sense RF from the transceiver."

"That's true," said Elmer. "Some even have built in antenna tuners so that when they sense RF from the transceiver, they automatically select the correct band and tune the antenna, too. But this one doesn't. It selects the band based on data from the transceiver. That's what that 9-pin data cable is for. According to the amp's manual, which you didn't read, you set the band switch to remote and the amp will follow the transceiver. No need to change bands by hand. Just install that cable as shown."

"Yes, Unck. That's the last connection. let's fire it up and see how it works. I'll plug it in."

"Wait!" said Dude. This drawing shows a wire connecting to something called ALC, what's that?"

"ALC stands for Automatic Level Control. It is a voltage – usually

see HAMBONE on page 7

from HAMBONE on page 6

between zero and negative four volts – that the amp sends to the transceiver to keep it from overdriving the amp. Some amps use it as part of their overload protection system, others don't. This one does not and the manual recommends not connecting it. So, we won't," said Elmer.

"But Unck, what would happen if we did hook it up? Protecting my new amp seems like a good idea."

"Well Hammy, used properly, ALC works as negative feedback to keep the drive to the amp at a level which provides maximum power output without excessive distortion. But, if you don't apply enough ALC, you don't get the protection you need and you find yourself overdriving the amp and transmitting a distorted signal rich in harmonics. That's bad."

"I think I've heard some of those on the air," said Hambone.

"But," Elmer continued, "If you apply too much, your output power becomes unstable and rises and falls as you speak. That's bad, too. We can talk more about negative feedback later, but now let's get this big boy going."

With all the cables plugged in and switches switched, Hambone set his transceiver for 20 watts output, pressed the mic button and said 'test'.

"WOW! Unck, did you see that? The power meter hit almost 500 watts!"

"Switch to CW and hold you key down," advised Elmer. "Now advance the transceiver output power until you see about 1,000 watts coming out of the amp. That's the maximum drive power you should apply to the amplifier. Hmm, looks like about 40 watts."

"Let's try making a contact," said Hambone switching to his real antenna and tapping out a long CQ on his key.

"Hey, what are you guys doing? The garage door keeps going up and down and the TV keeps changing channels!" came the voice of mom from upstairs.

"Oops," said Elmer. "It looks like you've got some RF filtering to do. You'd better check your stereo and PC, too. When you were running only 100 watts RF interference wasn't much of a problem, but with a kilowatt, it can be a different story."

"Hammy, do you smell something burning?" asked Dude.

"No, it's probably mom cooking upstairs."

"It's not me," came the voice. "I smell it, too."

"Oh, oh," said Dude. "You just smoked your tuner."

"And," observed Elmer, "This cheap coax you're using is getting pretty warm."

But Hammy was oblivious to all these comments, smells and smoke. He was listening to his transceiver beep out a reply to his CQ.

"Guys, I just got an answer and it's an F6 call, that's in France in Europe! And he says I'm 599! This amp rocks! QRO is the way to go!

You know, I think I agree with that wise-ass guy at the club meetings. You know, the one that's always saying, 'I never met a watt I didn't like'".

>> JCRAC FEEDBACK <<