



Radio Amateur News & Views

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RFI PROTECTION IN NATIONAL QUIET ZONES The January 11th RANV Meeting

Not a day goes by without some problem due to radio frequency interference (RFI). It seems I spend most of my days searching for HF interference on 20 meters, power line interference on 10 meters, repeater interference on 2 meters, or even WiFi interference on 2.4 GHz! Considering the millions of radio emitting devices out there, the spectrum is becoming an awful soup of unwanted noise. And, it is much worse in the big cities! The Federal Government has an interesting solution to all this at any of their Radio Astronomy installations. They simply outlaw all interference! No CQ's allowed in these areas.

Our speaker in January is Zack K1ZK. In 2002, he worked at the National Radio Astronomy Observatory (NRAO) in Green Bank, West Virginia. The specific job was with the Interference Protection Group, which is responsible for minimizing the RF interference to astronomical observations both from inside and outside the Observatory.

Radio astronomers make observations of RF sources that are extremely weak by ham radio standards: 1×10^{-17} watts/square meter. The ability to detect these weak signals requires not only some very advanced receiving and detection, but also requires RF-quiet observation environments.

One of the biggest challenges for the NRAO is on-site radiation. Because of the immense computing power necessary to process the information coming from the telescopes, there are a lot of RF generators on site. All those electronic switches and pulses could ruin attempts at observation. So, NRAO built a massive shielded room to house the noisiest electronics, including the operations console. The problem was that after a few years of operation, the shielded room had become "leaky." Zack will discuss the details of the problems and solutions to this very sticky situation. Some of the solutions might help solve our own RFI problems. Start your tour of the NRAO by finding more information and cool pictures at www.nrao.edu.

The first RANV meeting of 2005 will be Tuesday, January 11th, rain or shine at 7PM at the O'Brien Civic Center, 113 Patchen Road, South Burlington. Pre-game show and munchies will be at 6PM at Zack's (*no relation to the evening's speaker*) on Williston Road.

COMING UP

We have a boatload of activities coming up in the new year!

The January 11th RANV meeting will start out with a very interesting discussion of dealing with our old friend, Radio Frequency Interference and how the Feds deal with it.

This month is loaded with contests. NA QSO Party on January 15th, VHF Sweepstakes on January 22-23rd and the Vermont QSO Party on February 5-6th. Get on the air!

The February 8th RANV meeting will be the first of several meetings on antenna theory and design, with the first installment being on antenna basics.

On February 26th is the Vermont State Convention and Milton Hamfest. All sorts of nice talks and demos are being whipped up. We hope to see you there!

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OUR LAST RANV MEETING

by Carl ABIDD, Sec'y

The December meeting was held at the QTH of W1SJ. The topic was FOOD! This was our annual Holiday party. Mitch graciously opened up his house to the RANV membership. The first guests started to arrive just before 5:30. Contrary to broadcast threats from Mitch, the earliest arrivals didn't have to shovel snow out of the driveway. Mitch was busy in the kitchen, but he had already placed crackers and cheese and other snacks strategically around the living room and dining room to keep these early arrivals out of his way. There was one moment when we thought the meatballs would not stay hot, but a little alcohol in the burner and all was saved. Others started to arrive and the party started in earnest. Lots of good food, good drink and good fellowship, or should that be "peopleship"? It was good to see some of the faces that are usually hidden behind the radio. There were 29 members and guests in and out during the feast. Bob W1RFM was asking where the games were, but the only scheduled event was a viewing of a tape of last June's Field Day that aired on Channel 3. Good warm memories there. Fortunately, no one overdosed on the food. We were ready, as Ron KK1L came over from his shift at Essex Rescue and was there to help if needed during any gastrointestinal emergencies.

The evening started to wind down around 8:30. Debbie W1DEB, absent for most of the festivities due to a scheduled class, did make a showing around 8:45. Those who didn't make this year's event should make plans to attend next year. This was a great event, and we should all thank Mitch for doing a smash up job.

Trivia question: What were the 3 holiday decorations in the kitchen? Answer next month.

THE PREZ SEZ

by Brian N1BQ, President

When you get a little further along in my column this month you may be tempted to ask, "Hey Riley, what's the ham connection here?" My answer would be that, save for a couple of guys I saw at the last hamfest, most hams are humans!

Long about the beginning of last week Mr. Murphy was looking through the waning pages of his 2004 calendar book and determined that it was time to upset Riley's apple cart. So at about 3:30 AM on December 24th I found myself in the Emergency Room of the Department of Veterans' Affairs Hospital in White River Junction with a 103 degree temperature. "Tattooed Tom," a registered nurse and tattoo artist of some repute, was frantically trying to find a vein in which to start an IV to take blood samples and give me drugs!

Fast forward to 5 AM. They wheel me on my silver chariot into room 193 on First South Surgical and set me up in my high tech bed. I turn to my right and a bewhiskered face stares at me. I speak up and say, "Hi, I'm Brian and I have a leg infection, what are you in for?"

He answers, "I'm Tom and I have liver problems."

I nod and turn back to the mop of gray hair facing me across the aisle and repeat my question and get this answer: "I'm Joe and I have lung cancer, and they're cleaning me up so I can go home to die."

OOOOOppppppsssss... what to say... something told me I had nothing to lose so I said, "I am sorry Joe, I have no I idea what to say."

He laughed, a booming laugh I would come to know well, and said, "That's OK, no one else does either!"

Over the next two and one half days I got to see Joe deal with his broad extended family, kids and grandkids, and neighbors. They were warm and caring, ignorant, arrogant, or devastated. He dealt with each with always the right touch. In all that time I never saw his lower lip hang out and cry a tale

of woe. What I saw was a man planning to make the most of the two weeks to six months that life had left for him. This man of courage and dignity had lessons for all of us to learn.

I am hoping to get to New Hampshire to see Joe before Charon takes him on the last trip across the river. If I don't get there, I will leave that great Irish toast: "Joe, may you get to heaven a half hour before the devil knows you are dead!"

PEOPLE MOVES

There are a couple of people moves to report on this month. **Ken N1OSJ** has moved to Southern New Hampshire where he lives at the University of NH in Durham and commutes to WMUR Channel 9 in Manchester. Look for him when he dials in on Echolink.

Long time member **Bill KA1JNP** has just moved from Rhode Island to live full time in Georgia, Vermont. Bill owns several repeaters and I'm sure a few of them just might make their way up here!

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Please send submissions for the newsletter to the editor, W1SJ.

SS 2004 – THE VIEW OF THE BATTLE FROM KK1L

by Ron KK1L

Each year in late November a few local, but very serious contest operators get on the air to duke it out during the ARRL Phone Sweepstakes. The prize is top honors in the New England region and bragging rights. There is the thrill of so many operators on the air and the challenge of a complex exchange. Mitch refers to SS as the equivalent of the amateur radio super bowl. I think of it more like the Tour de France. Call it what you want. Sweeps is at the pinnacle of domestic contesting.

I haven't bothered to count the plaques Mitch has acquired over his 28 years of operating and dominating Sweepstakes in New England, but there are a lot of them. For at least six years I have been honing my skills in this contest with the goal of coming out on top in New England and beating Mitch. Some folks have the idea that if you spend enough money and have better equipment you will succeed in contesting. Not true. Skill, desire, and resourcefulness are what get the job done.

Mitch, of course, is not the only operator to look out for in this contest. Grant, K1KD, is a serious force to consider. He has all the qualities of a great contester and is right there with the leaders every year he enters. Unfortunately he was unable to get on this year due to a family emergency. Gerry W1VE, in New Hampshire is another one who will smoke you if you let off for even a moment. Al KE1FO, has been entering low power from his home in Milton recently. When he gets his station together and on the air and turns on the high power charm, look the heck out!

I prepared my station and myself better this year than in any previous year. I worked hard to make sure I was not going to start the contest exhausted as I have in the past. Making decisions about bands and rates and staying motivated is difficult when you are so tired you cannot think straight. That is expected after 18 hours of contesting, but not after

only three! I made getting at least seven hours sleep a priority the week before the contest.

The contest was tough this year. Changing propagation with the approaching solar cycle minimum and some really odd conditions made it a challenge. Studying trends convinced me not to mess around on 15 meters the first day or expect anything from 10 meters at all. The plan was to bleed 20 meters dry then move to 40 meters or skip right on to 80 meters. The QSO rate was going to be my guide.

I felt very good about the first several hours. Northwest Territories (NWT) called me for my 26th contact. THAT was very encouraging. A second NWT called shortly before Alaska about an hour later. Oddly though, I worked locals like Quebec, Pennsylvania and New Hampshire on 20 meters, too. I made 428 contacts on 20 meters before moving to 40 meters over four hours into the contest. That was unexpected. A good start, but strange for this part of the solar cycle. EVERYBODY was on 20 meters! Holding on to a place to call CQ was a serious chore.

I had not heard Mitch on yet, but I had not been looking either. Working W1VE earlier told me I was on track. We were exactly tied! However it was way too early to be worrying about the competition. I was encouraged but very wary.

There was no way I wanted the rate to slip below 60 QSO's per hour – ever! I aggressively acted on dips in the rate. Forty meters was in pretty good shape but crowded like 20 meters. I did some bouncing between 40 meters and 80 meters for the next several hours until turning in for the night at 3:35 AM with 948 contacts in the log – my best first day total. The last three hours were under my 60-rate goal at 58, 53 and 59.

Mitch is notorious for turning on the steam and running away when he hits 80 meters. As the contest slows down it is easier to casually keep tabs on the competition while looking for contacts on the second radio. I had worked Mitch on 80

meters about four hours earlier and I was 39 QSOs ahead. Awesome! That had never happened before. I found him again at 2:30 and my lead had stretched to 50 QSOs. Unbelievable! Mitch rarely makes mistakes and he never gives up! Either I was doing something right for a change or Mitch, who is normally ahead of me by now, was running into trouble. It turned out to be a little bit of both.

I have a predictable routine for SS, which Mitch knows. I can adapt somewhat, but I usually quit around 3:30, so I can get about three hours of sleep before I get up and go to Mass at 8. I get back on the radio at 9:30 and run until the end of the contest at 10 PM. This helps him accurately gauge how I am doing compared to him. Mitch generally plays the overnight portion by ear and is unpredictable. That means I am never really sure where I stand.

I got on the air at 9:30, as usual. Forty meters was awful, twenty meters was a blood bath, and my amplifier had decided to start acting up on me! Anything over 200 watts output and I was greeted by dancing blue plasma coming from my tuning capacitor! No, no, NO! I thought I fixed that earlier in the week after it had acted up during an earlier contest. I guess I should have done the job right, but that would have taken too long. Idiot! Nothing I can do about it now. I have no off time to take and I have no backup amplifier. I am stuck at 3dB over barefoot for the rest of the contest.

Okay Ron, don't get discouraged. "Remember that this game is 75% attitude. You are loud. You are the loudest signal on the band!" I told myself this over and over. Having caught up on sleep this week helped me stay focused on winning. You make your lead on day one, but this contest is won or lost on the second day. You have to keep plugging away as the pool of folks to work gets smaller. Every QSO counts!

Keeping rate on a very crowded 20 meters is tough work at high power. At 200 watts, it is much
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A UNIVERSAL PSK-31 INTERFACE

by Mitch WISJ

Planning to get on PSK-31, but don't know how to connect your radio to your computer? This article is for you! In the process of cleaning up various connecting cables to different radios, I built a cable system which is easy and fun to build. Not only will you be able to get on PSK-31, but also other software driven modes, such as SSTV, RTTY, AMTOR and even WSJT! And, better yet, you will be able to use different radios in the process.

This project got its start last Field Day, when I realized that I did not have a quick backup to my boom headset. Sure, I had another boom headset, but it was wired for the Yaesu FT-726 and not for the TS-830. And I had no headset at all for the DX-70. I decided to adopt the standard used by Heil, makers of the various boom headsets many contesters use. The headsets now all come with a 1/4" (phono) plug for receive audio and a 1/8" (miniature) plug for transmit audio. For each radio used, an adapter is made up. This adapter will have whatever microphone plug the radio requires (usually a 4, 6 or 8 pin screw-in connector), wired to a 1/8" female jack (for transmit audio) and 1/4" female jack (for foot switch or PTT). I also added a female RCA connector to allow connection of a tape player (CQ box). Figure 1, bottom left, shows a typical adapter. I made up adapters for each of my

three radios and then modified the 2 boom headsets accordingly. Now, any boom headset can work with any radio. Super!

But why stop here? For my various escapades with PSK-31 and SSTV, I had a connecting cable to interface the computer to my various radios. This cable had all sorts of plugs and jacks hanging off of it (poorly soldered) and was indeed, the patch cord from hell. It was time to start over!

It is prudent to understand a little theory on how to connect a computer to a radio. A computer sound card is just like a tape deck. It can record or play back and correspondingly, it has an input and output. The radio has an input (microphone) and output (speaker), too. So, there must be a connection from the radio speaker or headphone jack to the computer sound input. Then, there needs to be a connection from the computer sound output to the radio microphone input. Finally, a connection needs to be made from the computer serial port to the radio PTT line so that the computer program can key the radio. Realize that there are different levels involved in all of this. The output audio is on the order of a volt. The microphone input wants to see something on the order of 50 millivolts (.05 volts). If you ram the speaker output into a microphone input, I will guarantee the

audio will be total garbage and nothing will work right. Some computers and radios have multiple inputs, for both microphone (low level) and line level (high level). For this project, I recommend that you use the microphone input since a lot of computers and radios only have a microphone input. We want to keep the system as universal as possible.

Our cable will have to not only have the correct plugs and jacks, but also have some resistors to "marry" the output levels to the proper input levels. The PTT line also requires a resistor and transistor. One might get away without the resistors by just turning the computer and radio levels way down, but this is not recommended. The cable will require four 1/8" jacks (one stereo, 3 mono), one 1/4" jack and one DB-9F (serial port). Figure 2, bottom right, shows the cable wiring. The adapters (one for each radio, shown in Figure 1) will require a 1/8" jack, 1/4" jack and a microphone plug to match the radio.

Make the cable at least 6 feet long so that you have enough length, but don't go too long or RF pickup might be a problem. Before soldering all of the resistors in, I would first clip in some resistors and see how the audio levels are. Your particular computer or radio may require somewhat different values, although the above values should work OK. If you use 1/4-watt resistors and are adept

PSK-31 Cable... continued next page

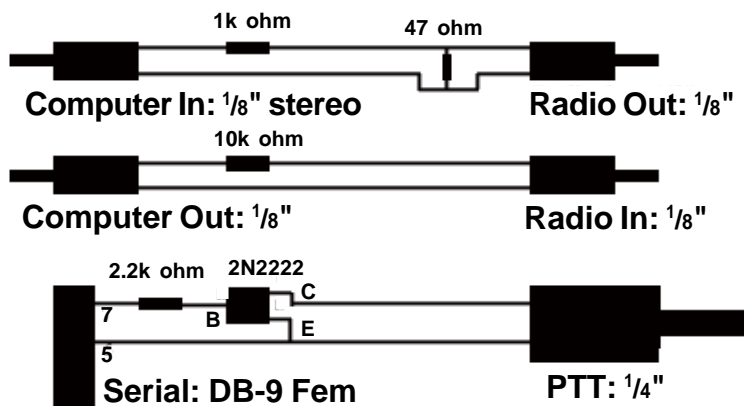


Fig. 2: Computer - Radio Cable



Fig. 1: Adapter: One for each radio

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with a soldering iron, you should be able to mount the resistors inside of the shell of the plugs.

Windows computers have a Windows Audio level control which should be used to finalize the settings. You will also have a volume control on your radio and perhaps a microphone gain. While there are many different settings that will work, try to set everything up so that there is a minimum amount of adjustment when you switch between SSB and PSK on your radio or when you switch between listening to CDs or playing radio with your computer. The Windows Audio control can be reached from the Control Panel or from a tab in the program you are running. There are two panels: one for output (*computer speaker level*) and one for computer record input. Also make sure to disable any audio processing in your radio. That will not help!

When it is time to set everything up, tune to the PSK-31 frequency of 14.070 MHz (*the antenna has to be connected and the band open*). Before plugging into the radio headphone jack, verify you hear PSK tones on frequency. Connect to the headphone jack. If you are running Digipan, you should see the blue speckled area of the waterfall display. If it is all black, you need a bit more audio. Too much blue, turn down the audio. If there is activity, you will see yellow traces in the blue speckled area and you will be able to eavesdrop.

Setting transmitting levels is best done with a power meter. Set the radio up to whatever key down power you desire, let's say 50 watts. Set Digipan to call a CQ and adjust the microphone gain (*or Windows output level*) so that you start to see your power reduce down from the 50 watts. The PSK tones should not run the radio right up to the key down power. If so, you are probably distorted. Try calling a few stations and see how you do. The great thing about PSK-31 is that low power and small antennas work great on this mode.

Once you have the levels working for PSK-31, other software modes should be easy to get on with minimal hardware setup. Enjoy!



Rolled up Interface Cable and 2 radio adapters

MILTON HAMFEST NEXT MONTH

Tell your friends and shout it from the rooftops! The 23rd annual Milton Hamfest and ARRL Vermont State Convention will be Saturday, February 26th. The program is coming together nicely. Already we have forums set up for Satellites, Kit Building, QRP, APRS and ARRL. More are being planned right now on other technical and operating topics. Many enjoyed the PSK-31 and Internet linking demonstrations last year. The demo team is working on a demo of Ham Shack remote control! Add to this the great flea market, vendor sales and the opportunity to meet a virtual who's who of amateur radio in Vermont and you have the makings of one great hamfest. But it doesn't happen by accident. It all requires hard work. Several of us are doing the planning work. But we need ALL OF YOU to do the promotional work. Folks don't come to hamfests just because they read about it in QST or in an E-mail. They go because they have either enjoyed it in the past or they have heard high recommendations about it from friends. That's your job! Spread the word about the Milton Hamfest and get as many people to come as you can. Get non-hams to come too. They may see something they like and become hams! All the details on the Milton Hamfest can be found at the website at www.ranv.org/milton.html.

BRUNCH, ANYONE?

A new club activity has been proposed for the slow activity months. Years ago, **RANV** used to have a couple of Sunday brunch gatherings a year, usually in January and April. We usually met between 11 and 1. No business except eating and talking was conducted. The brunch concept filled the needs of those who enjoyed early lunch and others who like a laid back late breakfast. I know of two local brunches, Trader Duke's (\$11.95) and Perry's (\$15.95). Perhaps there is something out there more reasonable. The beauty of the Sunday gatherings was that we got to see people who couldn't make the Tuesday night meetings. An inquiry to the **RANV** Reflector turned up little positive response so this will be something for further discussion at the next meeting.

CONSTRUCTION NIGHT

We are planning to do another one of the popular *Construction Night* meetings, but we have a dilemma. After several months of wracking our brains, we have yet to decide on a item to build. Your ideas are needed! What would you like to construct? Drop a line to Brian, Bob or Carl and let us know!

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harder! Fifteen meters was much less crowded and I could get nearly 300 watts out of the amp there. But 15 meters was not in great shape. Tough choices. I worked hard to run on 15 meters while searching on 20 meters. Occasionally, I would try to run 20 meters, draw more arcs from the amp, get my butt kicked, and retreat to 15 meters. The amp was getting worse. To add insult to injury when I heard Mitch at 1:20 in the afternoon, he was 64 QSOs ahead of me! I had no idea if he had more hours under his belt than me or if he was really ahead! Was I going to be able to close the gap knowing that I have never gained on Mitch on the second day in previous years?

Going into the last two hours I was still shy of a sweep by two sections – Pacific and Newfoundland. Usually, you can find Pacific on 20 meters on Sunday evening, but with the funky 20 meter conditions, I had not heard them! Newfoundland stations usually don't call CQ and they have to come to you. I worked hard to find a good spot to call on 80 meters for the last bit of the contest. That was a priority for me. I was able to get 3.753 and defend it with 300 watts! Newfoundland called in nearly 30 minutes later. I found Pacific on 20 meters just coming out of the noise with fifty minutes to go. They disappeared shortly after.

I ended the contest with 1532 contacts. I had my worst Sunday in five years. There clearly is a difference between 1200 and 200 watts! I finished the contest disappointed, thinking status quo had been maintained and that Mitch had won again. I had heard Mitch giving out contact number 1518 over an hour before the end. I did not find out until over a week later that Mitch had just run his 24 hours out. That really made it sink in that I had done the right thing to keep plugging away and not get discouraged.

The claimed scores: KK1L 245k, W1VE 244k, and WB1GQR 243k. It is just too close to call. The final word will be left up to the log checkers!

NORTH AMERICAN QSO PARTY

by *Ron KK1L*

This January it is time again for the North American QSO Party. It is a well attended contest with a twist – NO AMPLIFIERS! Everyone runs 100 watts. Not only that, but it is a friendly contest and only lasts 12 hours. The information you exchange is simply your name and state – no false 59 reports required.

Nearly every state is on the air as well as some North American DX. It is a great chance for folks to work on all band WAS because the number of states and NA countries on each band multiply your score.

The CW version of this contest is on Saturday January 8th. The phone version is on Saturday January 15th. Both run from 1PM until 1AM. Full details can be found on the National Contest Journal web site at www.ncjweb.com. Get on and have some fun and keep the cobwebs out of your HF station and your operating skills. If you miss it, the NA QSO Party is also held again in August.

VHF SS

by *Mitch W1SJ*

If there are not enough contests in the next few weeks, I'll add one more! The ARRL VHF Sweepstakes will take place January 22-23rd. VHF contests, of course, are open to all Technician class operators. This is your chance to get on and work some distant stations.

The best bet for activity is right around 144.2 and 50.125 MHz SSB. If you have a yagi, look for contacts to the south and occasionally towards Canada. Because we are far from the dense crowd, you will have to alternately tune around for stations and call CQ. Everyone should monitor 146.55 MHz to pick up local QSO's from FM-only stations.

OPEN HOUSE at VT QSO PARTY

by *Mitch*

The Vermont QSO Party will be held on the weekend of February 5-6th. Once again, I will open WB1GQR up for operator training and an open house. The QSO Party is the perfect place to learn HF operating as there is little to no pressure or QRM. The contest runs from 7 PM Friday until 7 PM on Sunday. I'll be scheduling 2-hour blocks from 10 AM until 6 PM each day. I'll also open up Saturday night 7-11, for any experienced operator who wants to tackle the *North American Sprint*, a contest held concurrently with the QSO Party. The morning hours usually involve European runs, so no Technicians at those times so that we stay legal with the 3rd Party rules.

If you are interested in getting an operating slot, please send me a 1st, 2nd and 3rd choice to w1sj@arrl.net. Don't wait too long as the good slots (*whatever they are*) go fast. Both new and experienced operators are welcome to come over and operate.

Everyone should make an effort to make some contacts in the Vermont QSO Party. Sadly, Vermont stations are very scarce in this event. Plan now to free up some time, get up some antennas (*the winter weather is perfect right now for antenna work*) and get ready to have fun. Generally, the best results can be had by calling CQ on 20 meters during the day. Keep an eye on 10 meters, however, as it may open up. Full rules for the QSO party are at www.ranv.org/vtqso.html.

DIRECTORY!

The Vermont Amateur Radio Directory is coming! The 2005 Directory will make its debut at the Milton Hamfest on February 26th. If you have any updates or information for the new directory be sure to pass them along to Mitch at w1sj@arrl.net.

NEXT MEETING:
“RFI Protection in Quiet Zones”
Tuesday, January 11th 7 PM
O’Brien Civic Center

MILTON HAMFEST
Saturday, February 26th 8 AM
Milton High School
Flea Market – Equipment – Forums – Exams

RANV

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