



# Radio Amateur News & Views

The Official Journal of the Radio Amateurs of Northern Vermont

SEPTEMBER 2003

Vol. 13 No. 9

## ROVING AND PSK-31

### The September 9<sup>th</sup> RANV Meeting

RANV officers have been working overtime to find a program for the September meeting and they have put together a real winner. We will have not one, but two interesting topics. Starting off the evening will be Mike N1JEZ showing off and talking about his Rover setup. For the ARRL VHF QSO Party, Mike will travel to various grid squares throughout New England. In the vehicle, he has serious equipment and antennae for 50, 144, 222, 432, 903 MHz and 1.2, 2.3, 3.3, 5.7, 10, 24 and 47 GHz! Anyone coming near this operation is guaranteed to have a bluish glow for several weeks!

In part 2, PSK-31 will be demonstrated. PSK-31 is a super efficient digital mode which has taken amateur radio by storm. Anyone with an HF radio and Pentium class computer can get on PSK-31. We'll show you how easy it is and even make a few contacts right at the meeting.

Roving and PSK-31 – high tech amateur radio – all yours to peruse at the next RANV meeting, Tuesday, September 9<sup>th</sup> at 7 PM at the O'Brien Civic Center, 113 Patchen Road, South Burlington. Chow time will be at 6 PM at Zack's on Williston Road.

## OCTOBER MEETING

Our October meeting will be something special. The meeting day will move back one day to Wednesday, October 8<sup>th</sup>. On that day we will have a joint meeting with the Central Vermont Amateur Radio Club. We will go on a field trip to SB Electronics in Barre. SB Electronics is the former Sprague Capacitor Plant. The "orange drop" capacitors we see at many hamfests likely come from this plant.

The pre-meeting eating fest and social meeting will take place at Jockey Hollow Pizza on South Main Street in Barre. We will then reconvene at the plant at 131 South Main Street. The field trip should take about 90 minutes.

To get to the meeting, take I-89 to Exit 6. Go down the hill on the 4-mile long access road, Route 63. When you reach the light at Route 14, make a left. Jockey Hollow is 1/4 mile ahead on the left. We recommend you join us there between 6 and 6:45. SB Electronics is about a mile further down Route 14 (South Main Street).

Leave about an hour travel time to and from the Burlington area.

## COMING UP!

The list of amateur radio events continue through the summer and right into the fall.

Be sure to join us for the September and October RANV meetings, with details shown at the left. We hope to see many of our Central Vermont members at the October field trip and meeting in Barre!

September 13-14<sup>th</sup> is the ARRL VHF QSO Party. Fire up those 6 and 2 meter radios and whatever else you have and make contacts on VHF and UHF!

Saturday, September 20<sup>th</sup> at 8AM is the CVARC Hamfest at the Waterbury Armory, right off of I-89 Exit 10. Two weeks later on October 3-4<sup>th</sup> is Hosstraders. Attend hamfests!

Looking for new hams? The Fall Weekend Class will be October 11-12<sup>th</sup>. Get those prospective hams to class and help the hobby grow! Contact W1SJ for course details.

## IN THIS ISSUE...

**Fox Hunt Results**

**Power Outage**

**PSK-31**

**MS-150**

**Burlington Triathlon**

**Prez Sez Serious Stuff**

# LAST RANV MEETING

by Mitch W1SJ

The August meeting was our Summer Picnic held at Knight's Point State Park on Sunday, August 3<sup>rd</sup>. From the radio traffic, I could tell that the early birds were in the park by 10:45 and were working feverishly to light the grills in preparation for the big feast. The crowd arrived in two waves, one early and one later on. They came by car and they came by boat. The total attendance was 30, a great number considering the awful forecast issued by the weather people (*wrong, as always*). I had the canopy all set to be quickly erected in the event of rain. This is likely why it didn't rain!

On the eating front, many hamburgers, hotdogs and chickens were cooked to perfection on the grills and were consumed shortly thereafter. On the radio front, many antennas were erected and many radios were operated. We had a DX-70 on a 20-meter dipole, an FT-817 on a G5RV, an FT-100 on a 6-meter dipole and a 2-meter radio on a vertical. There was a full UHF repeater out in the parking area and 3 fox transmitters running. The 20-meter station made a few casual SSB contacts and then we switched to PSK-31 for its debut at the picnic. I had SSTV set up also, but there wasn't much action on a hot Sunday afternoon. In the fox hunt, 3 transmitters were hidden around the park and some 8 hunters set out in hot pursuit. Jeff W1RL was the first to find all, and many participants found at least one.

The one downside of the event was a cantankerous Park Ranger who appeared to be bored with her duties and spent much of the day howling at us about one thing or another. It was like being back in grade school. We made the best of it and had a good time anyway.

# FOX HUNT

by Kayle KB1JOO

We had a good turnout for the August RANV Fox Hunt. This hunt was yet another initiation of a new Fox, or in this case Foxes. It was a beautiful night for the Fox Hunt and for the barbecue that followed it. We had set up on Redmond Road in Williston, at the site of the RANV Field Day, held several weeks earlier. Everyone reported strong signals from all areas, and Mitch was the first to find us in a mere 30 minutes. Freshly grilled burgers, hot dogs and cold Coca-Cola greeted all the successful hunters. Paul AA1SU informed us that we set up our grilling station in the exact location that RANV used for grilling at Field Day. Thanks for a great Fox Hunt and we look forward to what Mitch W1SJ has in store for us at the next Fox Hunt in October.

The hunt ran from 6:00 to 8:00 PM and here are the results:

#	Time	Hunters
1	6:30	W1SJ/W1DEB
2	7:07	K1UC
3	7:15	KM1Z
4	7:30	AA1SU
5	8:00	KB1FRW

# THE PREZ SEZ

by Brian N1BQ, President

In the words of Mark Twain, "rumors of my demise are greatly exaggerated." I am quite happy to still be here and still be up to cause mischief and mayhem in the world.

For those of you who have no idea what I am talking about, a brief recap; At the RANV picnic, I suffered a rather major heart attack and my wife had to make a hasty trip to the hospital. I was in the hospital for four days and came home somewhat chastened on the path to proper nutrition and health habits.

I would just like to take this time to express my heartfelt (*pun intended*) thanks to the many RANV people who expressed concern, came to visit, and more importantly gave of their time to help Sara W1SLR and I through a very rough period. The RANV family certainly pulled together on this.

We have all been to hamfests and we have all joked about the over-weight geeky ham with the five talkies spread around his expansive girth while consuming a plate of greasy fries. We ourselves have all inhaled plates of greasy fries and sausage at Hosstraders. I was about as physically active as one could be, yet that was not able to undo the damages from years of bad eating habits. A heart attack is a very unsubtle warning. Don't wait to have one before changing your ways.

The September meeting is a smorgasbord. Mike N1JEZ will open the meeting with the latest incarnation of his VHF/UHF/Microwave Contest Rover station. There have been lots of changes since last we saw it. Mike plans to arrive at the meeting at 6:30 for early inspection. The second part of the meeting will be a practical demonstration of PSK-31.

In October, we will have a joint meeting with CVARC in Barre at SB Electronics. This is a capacitor plant owned and run by Ed N1UR. To accommodate scheduling with CVARC, we will hold the meeting on the second Wednesday, (10/8) not Tuesday. Our pre-meeting dinner will instead be at CVARC's eatery, Jockey Hollow Pizza in South Barre, instead of Zacks. The plant is located nearby.

## Contacting RANV

In Person: Meeting, Sept. 9, 7pm,  
O'Brien Civic Center  
113 Patchen Rd, So. Burlington  
By Mail: PO Box 9392,  
So. Burlington, VT 05403  
By Radio: 145.15 repeater

WW Web: <http://www.ranv.org>

President: Brian N1BQ 899-4527  
n1bq@wulfdn.org  
VP/Tres Bob KB1FRW 434-2517  
mcamp@gmavt.net  
Secretary: Howie K2MME 651-0842  
k2mme@juno.com  
Editor: Mitch W1SJ 879-6589  
w1sj@arrl.net

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

# POWER OUTAGE

by Mitch WISJ

August 14<sup>th</sup>, 2003 at 4:11, the lights went out across much of the Northeast. Here, in Vermont, and much of New England, it was a normal evening. Television reported on the impact of the outage – reporting which millions could not see because there was no power. On the Internet, it was clearly evident which areas were dark as connectivity with blackened areas was lost. Closer to home, it was obvious that there were widespread power outages across the lake in New York as radio and TV stations located there went dark.

This was a blackout which we were assured would never happen. Over a week later, power company officials are still busy pointing fingers at each other. Some politicians have proclaimed higher electric rates to pay for a better power system. As an engineer, I know that this widespread outage was certainly preventable. I know this for several reasons. First, the problems leading up to the outage were lighting up in control rooms across the Northeast for an hour before the blackout. Second, some utilities managed to act quickly and decisively and not lose power – not only including most of New England and Quebec but many small utilities right smack in the middle of the blackout zone. The problem was clearly human error and lack of proper response. One might imagine that over the last several years, utilities have given buyouts to their most senior people and have placed lower paid, lesser-trained personnel in the control rooms. Why would we imagine this? Because every other company has followed this route in the last 10 years. Why should utilities be the exception?

Our advanced society hinges on a thread. As millions of people found out, it doesn't take much to plunge

us into darkness. With the darkness comes extreme difficulty in movement (*no airports, no urban trains, no traffic control, no gas*) and difficulty acquiring food and difficulty in providing a living environment (*no heat or AC*). Just recently, a gasoline pipeline feeding Phoenix, Arizona burst, instantly making gasoline a precious commodity and plunging the entire region into near riot. Do you think our government will protect us? Not much. The ability of police and fire and military to initially respond to a civil emergency is limited. Although many were evacuated, rescue could not save the 2800 who perished on September 11<sup>th</sup>. They could not stop the blackout and save the misery of thousands stuck in subways and elevators in 95-degree heat. And they cannot protect us all when the next major disaster occurs. And all of the current problems have had nothing to do with a terrorist action!

All people need to be more self-sufficient. As amateur radio opera-

***“It’s time to take stock to see how you could deal with a major infrastructure break”***

tors, we need to be on the leading edge of self-sufficiency. In Vermont, we have historically taken care of ourselves quite well. The 1999 ice storm blackout, which lasted 1-7 days, was mostly a nuisance to us and many are better prepared for the next occurrence.

It’s time to take stock to see how you could deal with a major infrastructure break. Some, like N1BQ and N1ZRA are completely off the grid and are immune to power failure at their locations. I keep several charged batteries at the ready for my radios and have a generator ready to go. But, for safety reasons, I don't store much gas. In a widespread

power outage, fuel would be hard to obtain. Do you have a lot of water stored up? It doesn't seem like a big deal until you realize that they had no water in much of Cleveland during the power outage. Think your cell phone will save the day? Think again. Everyone gets on the phone and even with backup power, the cell sites get woefully overloaded and few calls go through. Even landline phones stop working with heavy usage. I have backup power for my computer, but when the power goes off, so does the cable. However, DSL performed quite well in the blackout area. I learned that most of the ham repeaters in the New York area went dark. Some stayed on for a while until their batteries were exhausted. I called into one New Jersey repeater on IRLP which was fully operational on a generator. But, how long would the fuel last? Fortunately this was never tested. The location of 145.15 has a generator which automatically fires up upon a power failure. However,

the fuel supply there is limited and when exhausted, would take a long time to replenish. Even if the repeater was kept

running, how would you charge your batteries?

As you can see, there are more questions than answers. Providing full electrical backup for many days is an expensive proposition. Before the blackout, I was thinking about a rudimentary solar system to power the IRLP node to learn on and to lower the power bill. This goal has taken on more importance given the events which have unfolded.

So, if infrastructure suddenly went out and electric power and communication suddenly ceased, how would you be able to deal with the situation?

# PSK-31: A SUPER DIGITAL MODE

by Mitch WISJ

With all the talk about how effective PSK-31 is, it is surprising how few hams in our area actually use this mode. We first presented talks on PSK-31 at the 2000 Milton Hamfest and later that year at the June meeting. We have had PSK-31 capability for the last several years at Field Day, but it did not get used much. Now that the technology has matured, it is a good time to take a look at PSK-31, with an eye towards making it easy for anyone to get on this mode.

PSK-31 can be viewed as the modern day replacement of RTTY. RTTY, dating back to the turn of the century, is sent by a process called frequency shift keying (FSK). HF RTTY transmissions comprise two audio tones, 2125 and 2195 Hz. The low and high tones represent the digital 1's and 0's. RTTY uses the baudot code, which uses 5 digital bits to represent each character. RTTY has no error correction, which means when you have fading or interference, the copy becomes gibberish.

Several modes were devised to improve RTTY. AMTOR added a rudimentary error correction scheme. Then there was packet, using a different mode ASCII (*computer coding*) and the AX.25 tone scheme. Then there were combinations, such as PacTor, G-Tor and Clover. All were very effective in passing traffic especially in automatic mode, but each became more cumbersome to use as method of plain old ham to ham communication. This led to PSK-31.

PSK-31 uses a different scheme – phase shifting (*the PSK stands for phase shift keying*). The transmitted audio frequency stays the same, but its phase reverses for the digital 1's and 0's. Also, PSK uses a error correcting coding which is different from Baudot or ASCII. The receiving station detects these shifts and correctly displays the message. The “31” in PSK-31 is the baud rate (31 bps) and also the bandwidth - 31 Hz! Nearly 30 PSK-31 QSO's can take place in the space of one RTTY

QSO. Does 31 bps seem too slow? Since PSK-31 is designed for keyboard-to-keyboard QSO's, it is set for typical typing speed – up to 50 words per minute. How fast can you really type? For the speed demons, there is a PSK-63 mode for faster communications.

Most every HF operator who reads this has all the equipment to get on PSK-31: HF transceiver, computer (*Pentium class, with sound card*), antenna, wires and connectors. The “guts” of PSK-31 is the software, and virtually all of it is free. Do an Internet search on PSK-31 and you will be bombarded with more information and software sources than you know what to do with. I ended up downloading a program called Digipan. I saw this program demonstrated at a **RANV** meeting and it worked. I don't know if it is the best or worst or whatever. So, the first thing you do is download your software of choice and get it running on your computer. You won't receive anything, since you haven't hooked up the radio. That comes next!

Hooking up the radio to your computer is easy. There are 3 basic connections: 1. Radio audio output to sound card input; 2. Sound card output to radio microphone in; and 3. PTT - either manual switch, or signal from computer serial port. Now, before we get into details, if you have or are planning to buy an interface box like a RigBlaster, you're all set. Simply follow their directions for configuring and hooking up the box.

If you desire to do your own wiring, you will need some lengths of shielded cable and appropriate connectors. Wire up an RCA phono plug or miniature plug (*depending on your headphone jack*) to a miniature plug at the other end (*most commonly used for a sound card input*). Be sure to make the cable long enough for where you are going to place the computer and radio. If you have both a sound card microphone and sound card line input, I would use the line input. If you use the micro-

phone input, I would recommend that you build resistor pad in this line. You can get by with turning the radio volume way down, but that is not a good way to proceed. A suitable pad would be a 10k ohm resistor in series with the line and 500-ohm resistor across the line on the computer side. Or you can use a 500-ohm potentiometer for easy adjustment.

Next is the computer to radio connection. Unless your radio has a separate audio input jack, you will need to acquire a microphone plug to match the microphone jack on the radio. The output jack on the computer sound card is usually a stereo 3-pin miniature jack. The tip and ring are left and right, respectively, and the outside shell is ground. I have cheated with a mono plug, but this sometimes will give you problems. Wire either the left or right output (*not both*) to the audio input pin on the microphone plug and connect the shield as well. Again, it is recommended to use the resistor pad. For this line I would use a 100k resistor in series and a 5k resistor across the line on the microphone side, or a 5k ohm potentiometer.

While you are busy wiring the microphone plug, bring out a shielded wire from PTT and ground. Be sure you use the correct “ground” - some radios have a separate ground for PTT and microphone, and some don't. There are two ways to set up the PTT. For a cheap and dirty setup, wire the PTT and ground to a switch and this will be your PTT. This is cumbersome, but it works. A more desirable method of automatic PTT is to get a DB-9F connector to mate with your computer's serial port. Pin 5 goes to ground on the microphone connector. Pin 7 goes through a 2K resistor to the base of a 2N2222 transistor. The collector goes to the radio PTT and the emitter goes to ground. Now, whenever you click on transmit in your PSK program the radio will automatically go into transmit.

PSK-31 continued next page...

## PSK-31 from previous page

Let's receive some signals. The short list of frequencies for PSK-31 activity is: 3580.15, 7070.15, 14070.15, 21070.15 and 28120.15kHz. The 20 meter frequency will give you round the clock action. Start up your program. Many of the programs, like Digipan, show a spectral plot, called a "waterfall". It is a plot which moves across the screen. PSK signals are shown as traces. Simply click the mouse on one of these traces and you should be able to see the copy in the text window. Note that during peak activity times, you will see several traces - meaning that there are several QSO's going on. Remember, a lot of PSK activity can take place in the bandwidth of an SSB transceiver!

If you do not see any traces, or if the program is indicating that the received signal is too loud or too low, you will need to adjust the audio level. This can be done with the volume control, the resistor network (*if used*) or the software input settings for your sound card. This can be accessed from the PSK program from one of the menus.

When all is working on the receive side, try to call a CQ. For the initial setup, I would use a second receiver to make sure you are sending tones OK. Click on a clear space of spectrum and set the program to send a CQ. Listen on the second receiver (*with no antenna!*) and make sure you can hear the distinctive PSK tones. If they are very low or too loud, adjust the resistor network or adjust the sound card audio out.

When you think you have the transmitted signal adjusted correctly, try to make a contact. Either call CQ until you get an answer, or find someone else calling CQ. Operating PSK-31 does take a little knack to get used to, but you will find it is quite easy and very enjoyable. The best part of PSK-31 is that a very little signal goes a long way. Most PSK stations run less than 50 watts and have solid copy. This is the perfect mode for low power and small antennas!

There is a wealth of information on PSK-31. For help, try these sites: [www.psk31.com](http://www.psk31.com) and [www.qsl.net/wm2u/psk31.html](http://www.qsl.net/wm2u/psk31.html).

## MS-150 BIKE TOUR

by Paul AA1SU

On August 9-10, 2003, several RANV and STARC members joined forces to provide communications for the MS Bike Tour, also known as the MS-150 Green Mountain Getaway. Hams had to communicate over a wide area and over varying terrains. To do this, we used the St. Albans repeater, which proved to be rock solid over most of the course. There were some spots where coverage was spotty, but fortunately, there were not many.

The bikers left Sandbar State Park at 8:30 AM on Saturday morning, and headed for Johnson State College where they spent the night. Sounds simple right? Well, not really. The riders have four courses to choose from: 100 mile, 75 mile, 40 mile, and mountain bike. The mountain bike tour is not in the woods or anything like that. It is simply that the bikers ride over as many dirt roads as the organizers can find for them. To keep the volunteer riders safe, fed, and hydrated, there were six rest stops each day, and several SAG wagons to pick up tired and injured riders.

On Sunday morning, the bikers woke up, had a big breakfast, and headed back towards the Sand Bar. To make it more interesting, the trip back was different from the day before. This meant manning some different rest stops from Saturday. Because of some serious construction on Pleasant Valley Road in Underhill, the 75-mile course was diverted to traffic busy Rte 15. And to make matters worse, this was all done on a very hot and humid weekend. My hat's off to the bikers that rode so hard to raise money for a good cause.

I would like to thank everyone who helped make this weekend safe and successful: Mitch W1SJ, Debbie W1DEB, Charley W1CHG, Steve N1UKT, Don N1QKH, Dave KB1JME, John N1RUH, Ed N1PEA, Jeff N1YWB, Brad KD1BL, Bob KB1FRW, Paul AA1SU, Fran KM1Z, Jay K1UC, Moe N1ZBH, Jeff W1RL and Alex N1ALX. I would also like to thank the St. Albans Amateur Radio Club for the use of their repeater.

Special recognition also goes out to Brian N1BQ and Sara W1SLR. Brian and Sara helped me with meetings early on in the planning stages. As you know by now, Brian suffered a heart attack just a few days before the Bike Tour. They were going to provide communications help. However, they were with us in spirit, and I'm just so glad that Brian is on the road to recovery.

This was our third year covering the MS Bike Tour. The organizers really appreciate our help. I was told that the first year they had the bike ride in this new location, they did it with cell phones. But, with cell coverage being as poor as it is in Vermont, this did not go very well. Our coverage really impresses them. Events like this put amateur radio in a good light in the local community. Thanks again to all of you that helped me out. I am already looking forward to doing this next year.

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## GREATER BURLINGTON TRIATHLON

A week after the MS-150, another group of hams provided communications for the Greater Burlington Triathlon. This entailed a 1-mile swim, 25-mile bike ride and 6-mile run and was sponsored by the Shelburne Athletic Club, who also sponsors the Charlotte Half Marathon. The course covered very scenic areas around Shelburne and Charlotte beaches. The WB1GQR 145.15 repeater provided coverage along the entire course.

Paul AA1SU got the initial planning going. The communications support was put together at the last moment by ARES District 7 DEC Steve KB1IVE. Amateurs staffed checkpoints along the bike and running course and tracked the safe passage of the 150 participants. Thank you goes out to: Warren K1BKK, Zack K1ZK, Conor KB1III, John N1EMI, John N1WQS, Ute N1KDU Debbie W1DEB, Mitch W1SJ, Bob W4YFJ, Bob WB2OMZ.

**NEXT MEETING:  
“Roving ” and “PSK-31”  
Tuesday, September 9th, 7 PM  
O’Brien Civic Center**

**RANV**

P.O. Box 9392

South Burlington, Vt 05407

**<http://www.RANV.org>**