



RADIO AMATEUR NEWS & VIEWS

The Official Journal of the Radio Amateurs of Northern Vermont

January • 2011

An ARRL Special Service Club

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NEXT MEETING:

JANUARY 11, 2011—HF PROPAGATION

JOIN US ON JANUARY 11th FOR OUR FIRST MEETING OF THE NEW YEAR! Do you understand how HF propagation really works? Would you know what band to use to reach New Jersey at 4:00 in the afternoon? Why is 10 Meters still dead? Ever wonder why Sporadic E skip is so, ah, sporadic?

These questions and more will be covered at our January meeting as Dr. DX, aka W1SJ presents the details on how HF propagation works and how to know what bands to be on. Part of the discussion will be on how to make your antenna work best for the propagation. This talk will be geared towards the ham-in-the-street, with practical how-to guides for estimating propagation. If you operate on HF, you won't want to miss it! Also be sure to read the article this month on the 10 and 160 Meter Contests as a fine lead-in to this meeting.

HAM-CON

RANV Flea Table back again!

Start rounding up your stuff, radio related only (includes laptops, APRS, etc): rigs, accessories, connectors, antennas, tools, wire—you know the drill. More details coming, but pretty much as in past couple of years.

There will be a bulletin board for photos/listings of station furniture, boat anchors, things too big for the table.

Contact NIWWW@arrl.net with Qs.

BOOKMARK OUR BACKUP WEB PAGE: www.hamclass.net/ranv.html

One thing we have learned is that web sites, just like everything else, go down. A few years ago, the Sovernet site in Bellows Falls, Vermont, had a fire next door and the web sites located there were off line for 3 days. We maintain a mirror RANV site on the Hamclass domain, which is physically located out West. When our main site goes down, there would be no link, so you have to keep the URL address handy on your computer.

HAM BREAKFAST & HAM-CON

MITCH W1SJ

TWO BIG EVENTS WILL START OFF THE New Year. In what has become an annual event, the Ham Breakfast will take place Saturday, January 29th, 9:00^{AM} until noon at JP's Deli, 39 River Road (Route 117), 1.4 miles east of the Five Corners. The first hour is devoted to eating and meeting. That is followed by a semi-organized discussion on some aspect of amateur radio. With 30–40 folks showing up, it is like a mini-hamfest. Make plans to join us the last Saturday morning in January.

And speaking of hamfests, the highlight of the winter season is HAM-CON, to be held on Saturday, February 26th at the Hampton Inn in Colchester. The program is being put together as you read this and will be finalized in early February. Check the web site for new information as it changes. One thing which we need everyone to do is to sell the show! Contact as many friends (both ham and non-ham) as you can and have them come to the hamfest. A great method to get pals to the show is to car-pool. That way you can talk about the show before and after and easily get together for lunch afterwards. In today's world, it is not enough to put up some posters and send out e-mails to promote an event. The method which always works the best is for people to personally invite others. Please do all you can to get other hams (particularly those who have gone inactive) to attend the show and have a great time!



Upcoming, Notices, & Other Misc

- RANV: February Meeting—2/8
- HAM Breakfast—Saturday, 1/29; JP's Deli, 39 River Rd, Essex Jct
- HAM-CON: 2/26, Hampton Inn, Colchester; Exit 16 off I-89
- Steering Wheel: 3rd Tuesdays, 6:30-8:30—Ninety-Nine Restaurant, Taft Corners
- Dues due? Pay online at www.ranv.org/ranvpay.html
- VT Ham Radio Calendar www.vthrc.net

PREZ SEZ

BOB KB1FRW

HAPPY NEW YEAR!! YOU HAVE MADE THROUGH ANOTHER ONE, hopefully unscathed and smiling, if not...go turn on your radio and find someone to talk to, it will make things better.

LET'S LOOK BACK ON THE YEAR AND SEE HOW IT WAS.

January brought the Winter breakfast meeting were hams from all over came and talked about what they had done recently or what they wanted to do in the coming year. This particular event was the inspiration to build a pneumatic antenna-launching device inspired by W1AAT, Allen and VE2EQL, John. It turned out to be a very useful device at Field Day and several hams' QTHs. You can catch a presentation on this subject at HAMCON-2011.

February was the RANV Hamfest, which by all counts was a success with its many forums and large vendor area. We put W1V on the air again and many hams got to see their friends face-to-face, a good time all and all. It is coming at you again this year during the last weekend of February on Saturday, the 26th, be there or be square.

March brought us our monthly meeting with movie night and the antics of a Dxpedition on Desecheo Island in the Caribbean with a small glitch, the island was a military target for many years and had unexploded ordinance on it! It included a ex club member and FD operator Grant Kessling, K1KD who moved away a few years ago.

April slowed down some with a meeting on soldering Surface Mount Devices and the first walkathon of the year, the MS Walk.

Then came **May**, opening with Near Fest Hamfest and closing with the Vermont City Marathon. A couple of fun and big ham events, if you never have been part of either of these I highly recommend them. In between was a meeting presented by the US Border Patrol and the Essex Memorial Day Parade. It was a busy month!

Whats next? **June** and Field Day, what more is there to say? Field Day consumed the whole month and we were paid back with a win in the 2A category. Easy to say hard to do. Yeaahhhh Team!

July brought us Rich, W1ELL, and a presentation on how to mitigate a lightening strike, a good thing to be thinking about in July if you ask me. How many of us have buried our copper loops?

August was the club picnic and it was quite well attended even though the wind was blowing about 20-30 MPH all day, again the pneumatic antenna launcher put a couple of wire antenna way up in the trees and W1V was on the air again with a steady stream on operators and contacts.

September brought us a nice meeting with Mike, N1JEZ and his array of VHF/UHF solid state amplifier conversions. Quite well done, wish I could do that!

October had Bob, W1ICW and his EME adventures, another large project that has yielded amazing results for Bob and opened a new world.

Then we are on to **November** and a trip to Dynapower Co. in So. Burlington to see what they are up to and boy are they busy and a bit amazing. Besides the large water cooled transformers and giant power supplies (1 megawatt at 28 volts DC!), I keep hearing how impressed people were with their crimped lead wires that connected all this big stuff together. I swear that the braided copper wire was at least an inch in diameter and they had a machine to put lugs on the ends. This wasn't your Dad's crimper in his tool box by Gawd!

We wrapped it all up with the **December** holiday party at Mitch and Deb's place, had a pretty good time and a bit of a chance to celebrate our Field Day win. We ate a bunch of food, tried a Knish, and chit chatted. A good time and a good year.

I hope everyone has another good year and hope to see you at the Winter Breakfast, next meeting, or HAMCON.

73,

KB1FRW



FIELD DAY 2010— WE DID IT!

MITCH W1SJ

THE RESULTS ARE IN from 2010 Field Day and WE DID IT! RANV managed to once again capture the top spot in the 2A category. This is far and away the most competitive category, with 424 entries, some of whom are very competitive. And we also managed to finish in the Top Ten of all of the 2617 Field Day entries in 2010. In front of us were groups running 3, 4, 5, 7 and 24 transmitters compared to our 2! And we were a real QSO machine with our 4565 QSO's being 7th overall.

It is easy to forget where we were a month before this year's Field Day. We were coming off of a disappointing 2009 effort, where we thought we had enough to take the flag, but fell short. And worse yet, several key operators would not be with us, leaving 3 guys to do all of the major

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Meetings: 2ND Tuesdays • 7:00 PM
113 Patchen Road
South Burlington
The O'Brien Civic Center

Repeater: 145.150, PL100; **WBIGQR**

New Hams, Mentoring:
RANVMentor@gmail.com

BOB W1ICW

THE YEAR 2010 MARKS MY 30th YEAR as an amateur radio operator. That is nearly 3/4 of my life! To celebrate, this year I decided to do something REALLY different. I have always been known for pushing myself by trying out different aspects of the hobby... everything from QRP to satellite operating. I love a good technical challenge. I also like to do things that nobody else in my area is doing. This time around I really wanted to combine amateur radio with another of my recent hobbies, metal-working. I chose to try moonbounce. I had read with great interest about moonbounce operating, and was intrigued. But frankly, the prospect of putting up an antenna array with as much aluminum as a modern passenger jet put me off a bit. Then a few years ago, I read about WSJT by Joe Taylor, and how the software had revolutionized weak signal operating. The fact that EME could be done with a 100 watt single yagi station was stored in the back of my head for later reference. I HAD a single yagi and 100 watts!

I decided to try this out for myself in mid January. I downloaded the software, and dug out the homebrew rigblaster I had built for my Kenwood TS-2000X. A little bit of level setting and debugging later I was ready to try. I anxiously awaited the next moonrise. Once the moon cleared the horizon, I trained my satellite yagi on it, and started trying to decode a signal... ANY signal... After some initial fumbling, I managed to decode Anatoly, RK3FG, and I tried transmitting. I won't say it was an immediate success, but I did eventually manage to work him! I had my first EME QSO in the log, and I was HOOKED! I continued to work more stations in the coming weeks and months, but NONE of them came easy. I had a LOT to learn!

I set a goal for myself to assemble a modest EME station capable of regularly making contacts relatively painlessly. I wanted to prove to myself that moonbounce contacts could be made with a station that didn't take up as much real estate as Rhode Island, nor cost as much as the GDP of a third world country. I wanted to make as much of it as possible from scratch, within reason, both for cost savings, and for the sheer fun of making it. I chose not to homebrew the antennas for simplicity's sake. I figured I would have my hands full making the H frame, 4 port combiner, phasing cables, transverter, and the support structure.

I wanted to assemble the entire station as inexpensively as possible. I wanted the project to be a zero-cost affair, so several items of surplus gear were sold off to help fund it. To date, I am actually still right on track on my balance sheet. I was extremely fortunate to have 110 feet of 7/8 inch hardline and connectors donated by my favorite antenna crew (I work for a large wireless communications company) which would have seriously dented the budget. Still, it eats up a surprising amount of money to put together a complete station... rotors, antennas, rotor cable, feedline, never mind the amplifier and the rig. I already had a 2 meter all-mode rig in my Kenwood TS-2000X, but chose to go with an Elecraft XV-144 transverter for the EME station rig

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The following Letter-to-the-Editor was published November 24th in the *Times Argus* (www.timesargus.com) Nice job, Zack!

Out of this world

Thank you for publishing the story about how "Astronauts open world to Earthlings via photos." (*Times Argus*, Nov. 20). Readers may be interested to learn that the astronauts on the International Space Station (ISS)—and Col. Wheelock, in particular—have also been sharing their experiences, insights and observations directly with individuals on the ground via amateur radio.

I know several Vermonters who have actually had a conversation with Wheelock, and I hope to do so myself before he returns to Earth. If you have a radio scanner, add 145.800 MHz to your list—that's the amateur radio frequency the ISS transmits on for our part of the world. You need an amateur radio license to transmit to the ISS, but not to listen. More details on contacting the ISS are at issfanclub.com/.

Zachary Manganello
South Burlington

10 AND 160 METER CONTEST FIREWORKS —NOT!

MITCH W1SJ

THE 10 METER AND 160 METER CONTESTS, held in December, were a virtual classroom of different types of HF propagation techniques. As a prelude to the January RANV meeting on HF Propagation, it would be worthwhile to recount what was observed during these activities and how they relate to propagation.

One of my favorite contests in the high sunspot years, the 10 Meter Contest has been in the doldrums for a long time. According to the repeating 11 year sunspot cycle, we should be seeing a peak in 2011, which is not happening. Previously, I observed peaks around 2000 and 1990. When we are at sunspot maximum, 10 Meters supports worldwide communications all through the day and even a few hours into the night. Stations with tiny antennas and low power have no trouble working the world. Sadly, the sunspots have been mostly absent from the party and conditions have been poor. The guys with the kilowatts struggle and the guys with the little antennas hear nothing. But there are many different types of propagation activities on 10 Meters which kicked in during the contest.

I started at 7:00^{PM} and there was nothing for an hour except for two local stations. I shut everything down and went out dancing with Debbie. I was going to have fun (and get some much needed exercise) no matter what the conditions. I came back at 11:00^{PM} and instinctively threw on the radio even though I knew nothing would be there. I heard a few pops of signals fading in and out, so I fired up the auto CQ while I tended to some other things in the house. In a short while, a station in Tennessee answered, and then a guy in Kentucky, and then a few in the Carolinas. Inside of 15 minutes, I had a full pileup going and quickly worked every state in 4-land.

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because it gave me an excuse to buy one and build it. I already had a well optioned Elecraft K2, so I was set for an IF rig.

On the power front, I kept on the lookout for a 300 watt class 2 meter amplifier. Since JT65 does not require a linear amplifier, that broadened the choice considerably. I finally found a Vocomm Class C repeater amplifier for around 350 dollars, and purchased an IOTA 55 amp 12 volt switching power supply for another 200 dollars. This would give me 300 watts out with 7 watts drive (nicely within the output level of the Elecraft transverter)

The Elecraft transverter, transverter interface and assorted upgrades to my early model K2 were just under \$500.00.

Next I had to have a way of pointing the antennas. I located a Yaesu G800 azimuth rotor on a well known online auction site for \$200.00. The elevation rotor was a tougher nut to crack. I had toyed with the option of a Yaesu 5400 or 5500 az/el but ruled them out as too expensive. Used, they were pure unobtainium. I finally had to bite the bullet and purchase a new G-550 elevation rotor. Combined price was around \$600.00 for both rotors, and about 125 dollars off the cost of a new G-5500. The used G800 rotor was disassembled, checked, and the bearings repacked with low temperature snowmobile grease.

Antennas took a lot of thought and consideration. I wanted an array large enough to allow me to regularly work stations, but small enough not to overwhelm the modest rotors or the homebrew support mast I had planned. I know of at least one former EME operator here in Vermont who gave up the battle of keeping a large moonbounce array aloft in Vermont winter ice storms. Another advantage of a smaller array is a broader beamwidth, thereby reducing the pointing accuracy requirements. I read all I could find on the subject, especially a blurb on the Directive Systems website about the KC4/W1MRQ operation in Antarctica. I figured if an array of 4 shorter antennas could survive at the South Pole, then it would probably be more than adequate for me. Ultimately the M2 2M7 was chosen due to its compact size, decent performance, and reasonable price. I ordered four of them and assembled and adjusted them once they arrived. Chalk up another \$650 or so to the balance sheet, and some more surplus gear went up for sale.

The final installment was the assorted rotor cable, stainless u-bolts, 1 1/2 inch thick wall aluminum tubing for the H frame, preamp, and other various and sundry bits and pieces of hardware, including a 21 foot piece of 2 inch galvanized steel pipe I used for the support mast. So far, slightly over \$2300.00 spent total. Again, I list these costs to illustrate that EME is not outside of the realm of possibility for the average ham, even in these tough economic times. If things are purchased in a piecemeal fashion as I have done, a full station can be assembled for a minimum of pain and suffering.

I assembled the H frame for the antennas out of 6061-T6 thick wall 1 1/2 inch aluminum tubing. Plenty rugged, light, and I was able to purchase the aluminum locally

from a machine shop in 24 foot lengths and cut them down to length myself for far less than ordering online and shipping. The cross brackets were made in the home metal shop from 6061-T6 1/4 inch thick aluminum and drilled all at the same time, so I knew the holes would all line up. Similarly, a 4 port power divider was made out of 3/8 copper pipe, 1 inch aluminum box tubing, and 5 N connectors. All the connectors were mounted with stainless hardware and then the hardware was covered with JB-Weld epoxy to render them waterproof.

I assembled the H frame for the antennas out of 6061-T6 thick wall 1 1/2 inch aluminum tubing. Plenty rugged, light, and I was able to purchase the aluminum locally from a machine shop in 24 foot lengths and

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RANV QSO PARTY RESULTS

MITCH W1SJ

THE FIRST RANV QSO PARTY is now history. We got increased activity on the repeater during the first week of the event, but sadly, things tailed off after that.

Three logs were submitted. Jim KE1AZ reported 15 QSO's and 3 multipliers for a score of 45. Paul AA1SU reported 19 QSO's and 3 multipliers for a score of 57 over a two day period. I know he was on at other times, but it appears he forgot to log those contacts. Paul claimed credit for 19 multipliers, counting new multipliers every time he operated from another county as he drove around for work.

However, the rules state that multipliers only consist of the total number of Vermont counties over the operating period. Mitch W1SJ reported 20 QSO's and 5 multipliers for a score of 100. Ironically, it was the mobile activities of AA1SU which put Mitch over the top. At the party, some 42 hours past the submission deadline, Bob KB1FRW produced a handwritten log with something like 19 QSO's and 5 multipliers. As I was vainly trying to read the chicken scratch, Bob mentioned, "oh yeah, and I forgot to log this guy and then I need to add that other guy, but I forgot his call..."

I have determined that W1SJ is the winner of the 2010 RANV QSO Party and he is to receive all accolades and abuse which comes with this achievement.



Contest Fireworks cont.

After an hour, the band was totally dead. This was a classic sporadic-E opening. It occurred at night, unlike normal F2 propagation which is a daytime phenomenon on 10 Meters. The openings were localized to a relatively small area, about 650–1100 miles distant. Excited by this opening, I couldn't wait for Saturday.

Unfortunately, I got excited for nothing. Saturday, was mostly a bust. I did manage to work a whole bunch of stations in South America, particularly Argentina. This is a classic Transequatorial (Trans-E) opening. For some reason, the propagation only follows a North–South line and is it maximized between stations of the same latitude north and south. If you go south to latitude 44 degrees, you end up in Argentina and Chile. Unfortunately, there aren't that many hams down that way, so when you work all 15 of them, there isn't much to do. So after a not-so-productive day of 19 QSO's I went home for dinner.

I fired up the station Sunday just before noon. Again I heard a few pops, and turned on the auto CQ. Inside of minutes, I had stations all over 7-land calling me. This was a bonafide F2 opening, where the F2 layer is supporting the propagation and the skip distance is typically 1500–2500 miles. I worked every state in 6- and 7-land before the band went dead after 75 minutes. The good news is that this was the first F2 opening I have observed from Vermont in 6 years. The bad news is that it went away quickly.

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Field Day cont.

operating, I was starting to think that Field Day would be a much scaled down effort. Finally, in the remaining weeks, things started to turn around and we were able to staff and supply yet another serious effort. It is the fact that we were able to turn this whole thing around from the depths of despair to a victory which makes it all that much sweeter.

Someone asked if we have won 2A more than any other group. Probably yes. Over the last 25 years we have captured the top spot in 2A a total of 6 times, in 2010, 2008, 2006, 1999, 1987 and 1986. The early wins were under the name Silicon Junction Radio Club, but it was essentially the same location, some of the same equipment and antennas and some of the same operators. (Now you know how old some of those antennas and operators really are!) We also finished second 3 times and third 6 times. There were several groups in Texas who used to beat us a lot, but no one topped 2A more than twice. That being said, there are some legendary Field Day groups who have been winning in the higher transmitter categories for many years. The hardest part of all of this is to keep a large group focused and muster a great effort year after year. In that regard, we are on a fairly short list of Field Day groups.

Of course, the pundits will tell you the Field Day isn't a contest. OK, so it isn't. But scoring aside, it still means that our group is one of the best there is at playing ham radio and getting the communications through and we should be very, very proud of that!

Everyone involved in Field Day should acknowledge their part in an excellent group effort. And in a few short months, we will start the planning to do it all over again!



VEC Exams

Every 2nd Friday
6:30–8:00^{PM}

29 Mansfield Ave. • Burlington

Tech, General, Extra class licenses.

Bring 2 forms of identification, copies of existing license and CSCE (if applicable), pens and pencils, and the exam fee (\$15—exact amount only please).

??S Email Ralph KDIR@arrl.net or the GBA ARRL VE Team website at BARCVT.net

FUN OPERATING IN JANUARY

MITCH W1SJ

LOOKING FOR a fun operating activity? Try the North American QSO Party (NAQP) on Saturday, January 15th. This event is a bit different than most HF contests. First, it only runs 12 hours from 1:00^{PM} until 1:00^{AM}. You operate for only 10 hours out of this time, leaving time for dinner and some relaxing along the way.

Second, the maximum power is only 100 watts. All the big kilowatts will be parked on the shelf for this one and you will suddenly become competitive with your low power signal. The multipliers are states, provinces, and North American countries per band.

From an operating standpoint, get on at the beginning of the contest and work as many stations as you can on 20 Meters, the money band for most of us. But certainly check 15 Meters to pick up multipliers there, too.

When 20 Meters fizzles around 6:00^{PM}, you move down to 40 Meters, and the rates will likely drop. The last hours are spent on 80 and 160 Meters which can be great or horrible, depending on the propagation.

The exchange is quite different in this contest. You give your name and state, which is a nice personal touch. The NAQP is a relaxing low-key contest, perfect for tuning up your operating skills and picking up new states on various bands.

Give it a try!



Moonbounce cont.

cut them down to length myself for far less than ordering online and shipping. The cross brackets were made in the home metal shop from 6061-T6 1/4 inch thick aluminum and drilled all at the same time, so I knew the holes would all line up. Similarly, a 4 port power divider was made out of 3/8 copper pipe, 1 inch aluminum box tubing, and 5 N connectors. All the connectors were mounted with stainless hardware and then the hardware was covered with JB-Weld epoxy to render them waterproof.

The support structure is a piece of 2 inch OD galvanized steel water pipe, also purchased locally. Since I had no way to transport the 21 foot length, the sprinkler company purchased it from was nice enough to deliver the pipe to my house on one of their trips to a nearby jobsite. I made brackets to mount this to a pole barn on my property. The brackets were made such that I could tilt the array over using a small boat winch for easy assembly or maintenance, since I am not, nor ever have been, a heights person. The array can be tilted over safely by one person in a couple minutes. A 12 inch square metal box was scrounged to mount the relays and preamp in at the bottom of the mast, and all the feedlines were run to the pole barn from the operating position inside 4 inch irrigation tubing buried underground.

The array is compact: roughly a box 8 foot square. The antennas have 8 foot booms, and the spacing dimension is roughly 7 feet, so it makes for a short, boxy array. The M2 website shows a similar array, albeit with closer spacing, in the pickup bed of a small truck as a VHF rover setup.

Now is a good time to take a step back from discussing hardware to look at software.

Part II in February

Contest Fireworks cont.

The previous week I operated in the 160 Meter Contest. While 10 Meter activity these days is usually higher than the Maximum Usable Frequency and most signals skip through the ionosphere into space, virtually all of the 160 Meter signals bounce off the ionosphere—if they can get there. During daylight hours, the lower levels of the ionosphere absorb the lower frequencies around 160 Meters. So, to be able to make

long distance contacts, things have to be dark in both locations. But that's not all.

The Earth's geomagnetic field is often the villain here. When that field is disturbed or unsettled, all sorts of noise and garbage fills up the lower frequencies, drowning out the weak signals from Europe and the West Coast. I had a reasonably good year, but things were definitely down from last year. And I received all sorts of reports of Europeans calling me in vain. I just couldn't copy them through the noise! Now, how does knowledge of propagation improve this situation? That knowledge would tell me that my 50-foot high dipole is too low to support long distance propagation and an Inverted V at 250 feet would get the job done. And the chances of that antenna being deployed at my house rival winning the lottery!





RANV

**PO Box 9392
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NEWS & VIEWS

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www.RANV.org

NEXT MEETING

Tuesday • January 11 • **7:00 pm**

O'Brien Civic Center
113 Patchen Road • South Burlington

“HF Propagation”