



RADIO AMATEUR News & Views

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An ARRL Special Service Club

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NEXT MEETING:

“BROADCASTING”

THE NOVEMBER MEETING will be something a little different. We are pleased to have Marselis Parsons as our speaker. Marselis is the former News Director of WCAX-TV and served for many years as the Anchor of the Channel 3 News at 6 p.m. Marselis has now retired from the daily grind, but he will never be done telling stories. He will be telling us a little bit about the history of broadcasting, but not from the technical side. This is sure to be an enjoyable and fun evening.

ELECTIONS

Don't forget to bring in your ballot! You should find one for each member in your household inserted in this newsletter.

The slate is set as follows:

• **President:**

Bob Allen KB1FRW

Write-in: _____

• **VP/Treasurer:**

Carl Dow AB1DD

Write-in: _____

• **Secretary:**

Jeff Bonn N1YD

Write-in: _____



DECEMBER MEETING

No details at publication. The Annual Holiday Party is scheduled in place of the usual meeting. All are welcome! You're requested to bring something for the pot-luck so start thinkin' on it, and keep your eyes and ears peeled for date/time/location/other details.



DECIBELS DEMYSTIFIED PART 3

Bob W1ICW

dB, dBm, SINAD, and ssG...oh my!

OCCASIONALLY, WE WILL SEE POWERS REPRESENTED AS dBm NUMBERS, and there is a lot of confusion surrounding this term. Simply put, 0 dBm is a finite power level, meaning 0 dB referenced to a milliwatt. So 0 dBm = 1 milliwatt of power. That's 1/1000th of a watt. +10 dBm would be ten times that or 10 milliwatts, or 0.01 watt. +20 dBm would be 100 times a milliwatt (100 milliwatts), or 0.1 watts, and so on. dBm is simply another way of referring to power. It is oftentimes a lot simpler to stay in dBm if we have a lot of gains and losses, and then convert the net result back to watts at the end.

For instance, say I have a transmitter that puts out 100 watts, a feedline that loses 3 dB, and an antenna gain of 6 dB. Instead of having to use the dB formula (10 log b/a) three times, we convert the power to dBm once, do the additions and subtractions, and convert back, and we never have to touch the log button on our calculator.

Let me show you. 100 watts = 100,000 milliwatts (since 1 milliwatt is 1/1000th of a watt) so it is +50 dBm (remember, 50 dB is 1 followed by 5 zeroes times the power). Then we lose -3 dB in the coax, so we are down to +47 dBm (+50 minus 3 dB loss), then we gain +6 dB at the antenna, for a net result of +53 dBm. We know this is +3 dB above +50 dBm so it should be double the power, or 200 watts. When all is said and done, we have effectively doubled the power of our 100 watt transmitter with this antenna system.

Remember dB is a value of CHANGE up or down, while dBm represents a finite power level. It's like saying, "I have so many watts of power." All the same rules of decibels we used above apply when using dBm. So, if for instance I wanted to know how many dBm 5 watts of power is...

I know 1 watt is 1000 milliwatts of power, or +30 dBm. I also know that ten times that is 10 watts, or +40 dBm. So half that should be +40 dBm minus 3 dB, or +37 dBm, = 5 watts.

While these values are not perfect, they are sure as heck close enough. If you really want EXACT values, you can either break out your scientific calculator, or use one of the many online converters. One good one is here: www.radius.net/power-to-dbm-conversion.html

We have all looked at the specs for the latest YaeComWood gee-whiz gadget on the market and drooled over its new features, or extra bands or what-have-you. Sometimes we will even go so far as to check the receiver specs, which are usually expressed in SINAD for a particular microvolt level, usually something like ".25 microvolts for 12 dB SINAD." The smaller this number is, the better the receiver

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SECRETARY'S REPORT

JEFF N1YD, SECRETARY

OCTOBER MEETING

Business:

- The meeting began with elections. Bob Allen KB1FRW was reelected as president, Carl Dow AB1DD was reelected as treasurer, and I was reelected as secretary.
- Welcome to new hams Jeremy KB1WDM, and Kathi's Aunt Betty, who passed the Technician exam, but whose call sign was not known at meeting time. [Ed: Betty's call is KB1WDN]
- Kathi will bring snacks to the next meeting.

Presentation: SKYWARN

Greg Hansen from the National Weather Service spoke to us about SKYWARN. The National Weather service has 122 offices across the country. Greg works out of Burlington International Airport. Some of the NWS "products" include outlooks, watches, and warnings. NWS runs the *Emergency Alert System* to announce severe weather like tornadoes, hail, and strong wind. (The state gets about one tornado per year.) Historical weather data is available at the IEM Cow site, which has nothing to do with dairy animals.

The NWS uses 5 to 10 cm radar to detect storms. The state is covered pretty well except for parts of the Northeast Kingdom.

The main NWS website for our area is www.weather.gov/btv. Along with current conditions and forecasts, it provides a way for the public to report a storm. Reporting by the public is useful because it provides "ground truth." The reports help to calibrate the radar images vs. actual events, and to confirm severe weather reports. Reports from areas that do not have good radar coverage are also quite useful. Some observers sent in pictures of tomato-sized hail, which was pretty cool.

To report a storm, contact WX1BT on 145.110, weather.gov/btv, or call 800 863-4279. If you would like to set up your own weather station, www.cocorahs.org describes how to get started.



SEPTEMBER MEETING

Business:

- NEAR-Fest X will be on Friday and Saturday (October 14th and 15th) at the Deerfield Fairgrounds in Deerfield, New Hampshire. It's really good. If you are interested, discount tickets will be available at our next meeting.
- Our next meeting is not to be missed. We will have elections and Paul will bring snacks. What more could you

want? Just show up and you can score some Oreos and become a club officer. Rumour has it that the position of club secretary is open.

- Bob Brown, W4YFJ, described his work during Tropical Storm Irene. The flooding was quite different from the usual calls and emergencies that he handles. There was very little that anyone could do as rising water slowly destroyed homes and buildings.

- HAM-CON will be February 25th at the Holiday Inn. The admission fee will be the same as last year. Mitch urged us to use the repeater. Put a radio in your car, and turn it on.

Presentation:

Mitch W1SJ described VHF contesting, or "Mountaintopping." The VHF bands are more or less line of sight, so the only way to compete at a high level :-) is to set up your station on top of a suitable mountain.

Some of the key factors are elevation, population, vehicle access, and noise level. Mount Mansfield is noisy, Mount Equinox has a valley toward New York that is quite good, and Mount Washington is not close to major population centers. A mountain that can reach New York City, and Albany is especially favorable. Mount Equinox seems to be the best.

On 2 meters with a 20 db gain antenna, 180–200 miles is possible. Mitch reached Virginia once.

You will have to bring your own power. Batteries are OK for QRP, but anything more needs a generator. Bring a table and chair, or plan to be uncomfortable. Mitch sets up an elaborate array of antennas using a drive-on mount and a second, guyed, mast. Plan ahead—the antennas have to be something that you can handle yourself in wind, rain, and other difficult conditions.

Mitch takes this stuff seriously. His approach is "one radio per band." That means radios for 2, 6, and 10 meters, also 440MHz FM, 2 meter FM, 222 MHz, 903 MHz, 1.3 GHz, and 3.4 GHz. He also brings backups. Each mast has an antenna rotator. All of the radios feed into an audio mixer and *one* set of headphones.

Any such contesting trip can turn into a survival exercise. Bring lots of supplies and be prepared for wind, sun, cold, rain, etc. Mitch is convinced that catamounts are not really extinct because he saw one, and it hissed at him. In general, be careful.

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Web: www.RANV.org

Reflector:
groups.yahoo.com/group/RANV

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

Repeater: 145.150, PL100; **WB1GQR**

New Hams, Mentoring:
RANVMentor@gmail.com



FIELD DAY 2011 —WE REALLY KICKED BUTT

Mitch W1SJ

SINCE LAST FIELD DAY, VIEWERS OF OUR WEB SITE have seen the heading, "Field Day 2011—We Kicked Butt". We submitted a massive score and were proud of the results of our efforts. What we didn't know at the time was who else put up a massive score, besting our efforts. With the publication of the Field Day results, that has been decided. We have repeated as winners in the Field Day 2A category. Congratulations and great job everyone!

I was very surprised at how far ahead of the pack we were—by some 2500 points. I truly expected it to be a real horse race as the competitive Field Day groups fattened up their scores with great openings on 6 and 10 meters.

Another notable accomplishment is that we were repeat winners. While there are some dynasties in the higher transmitter categories, repeaters are much fewer in the super competitive 2A category. Our forerunner, known as the Silicon Junction Radio Club, operating as K1VT, did it way back in 1986–87. W5NN did it in 1995–96 and W6PT did it in 2002–03. K5DX won in two non-consecutive years (90, 97). Going back 25 years, our group and forerunners topped 2A a total of 7 times.

But what was even more amazing was that with 16320 points, we bested a 2A scoring record which stood for 18 years! In 1993, a group of contest operators assembled in the Virgin Islands and amassed an amazing score (in those years) of 15580 points. That group was organized by a fellow with the call sign N2EA. And by the way, Jim also did a couple of CW stints with us this year, so he is part of the legacy of both records!

Overall, across all categories we were 11th. If we had gotten a bunch of kids to operate or if we'd picked up another 50 phone

Continued next page

TEN METER FIREWORKS

Mitch W1SJ

JUST ON THE OFF-CHANCE THAT you are locked in metal-framed building with no receiver or antenna available, be advised that 10 meters is back! Some weeks back, hams reported that they were working openings on 10 meters. I finally put the radio on and the band was wide open. This wasn't the typical in-and-out Sporadic E opening we have been seeing over the years, but a full F2 opening. The band was opening up well into Europe in the morning, continued open across the U.S. all afternoon, and stayed open several hours past sunset. And this has been going on for weeks.

If you have been following propagation news, you know that sunspots have been on the most-wanted list. Various theories were proposed by the experts, culminating in the observation that we might be in a repeat of the 18th century Maunder Minimum, where there was no sunspot maximum for 30 years. Then, boom! Numerous sunspots appeared out of nowhere, the bands opened up big time and a large solar event triggered a massive aurora borealis a couple of weeks ago. So much for predictions by the experts.

It is hard to say if these great propagation times will hang around long. There apparently is a lot we don't understand. Meanwhile, don't wait! Fire up the radio, toss a wire into a tree, and enjoy the openings. Conditions are such that low power and small antennas are working the world. It doesn't get better than that, so get on while it lasts. And let's hope that the conditions hang in there through mid-December when we can have a monster time in the Ten Meter Contest!



RANV HOLIDAY PARTY DECEMBER 13TH

Mitch W1SJ

MARK TUESDAY, DECEMBER 13TH ON YOUR CALENDAR for the RANV Holiday Party. There'll be plenty of fun, food and good times to share. We'll have the usual types of food available in addition to the other dishes which attendees bring. If you have any special requests or would like us to try something different, let me know. I'll have a survey out in early December to determine who is bringing what.

And since we did so well in Field Day this year, we will celebrate that with chocolate cake! And I'm sure plenty of other desserts will make an appearance too. Bring a hearty appetite!

Let's try to pick up the attendance by getting some new people to join us this year. And by all means, bring your S.O. too, as this is a family event. We'll try to tone down the ham radio shop talk! It would be nice to come up with some new family-friendly activities—send your suggestions along soon!



FD cont.

QSO's, we would have landed 9th. In terms of total QSO's, we were a veritable QSO-making machine and finished 4th. The 3 groups who made more QSOs were running 25, 5, and 3 transmitters to our 2!

There have been a number of E-mail discussions on what our "secret" is. And the answer is that there is no secret—just a lot of hard work and attention to detail. Our equipment and antennas are typical of that found in any serious Field Day group. And our operators, all of whom are very good at what they do, are not a who's-who of worldwide contesters (although I try to recruit the big guys every year!). Almost 20% of our total QSO's were made by non-contesters on the VHF and GOTA stations! In a contest, the key is knowing the best band to be on and how to put more contacts in the log than the competition. And here is the bad news—a lot of this is luck! If the propagation shifts west, the folks out in Texas have us for lunch!

What do we do next year? Simple—we do what we do best...set up Field Day and make a lot of contacts. There is always room for improvement and producing more results with less toil. And in the 25 years we have been involved in this, hundreds of hams have received training in the various aspects of setting up competitive stations to provide reliable communications. That's more of a lasting legacy than any accounting of points!



**DON'T
FORGET
YOUR BALLOT!**

**IT'S
ANNUAL
ELECTION TIME.**

REMINDER: 2011 SET

Vermont's SET (Simulated Emergency Test) is coming up right after Thanksgiving. This is the ARRL's annual effort to test our ARES emergency capabilities. It's a contest, of sorts, as well, with scoring on several fronts. Scores are reported in *QST*, and we want Vermont in there! Details will be out shortly to DEC's and EC's. Expect to hear directly from the one in your area.

You do not have to be an ARES member to play,
everyone is welcome.

So, mark your calendar for Saturday, November 26,
0900 to 1200, and keep an ear out.

MEMBER PROFILE: RICH LANG W1ELL

Kathi K1WAL

RICHARD LANG HAS BEEN A LICENSED HAM FOR ONLY A COUPLE OF YEARS, BUT his whole life has led up to it. *It was inevitable.*

Rich's original callsign was AB1KN. He changed it to the vanity call W1ELL in honor of his grandfather Edward Lewis Leyh. It was his grandfather who introduced him to electronics. Edward Leyh was a jeweler and engraver by trade and a tinkerer by nature. He would build most of the things he wanted, even fishing reels! He helped set up KDKA in Pittsburgh, PA—the first commercially licensed broadcast station in the US! Edward was standing on the roof of the station when it powered up for the first time. He was holding an umbrella and felt his fingers tingling from the RF in the air. When he built a new home in 1918 he had an antenna built into the framing so he could listen to the radio. The floor had acid stains from the batteries that powered the receiver.

Rich enjoyed working with his grandfather, who encouraged him to try things for himself and gave him his experimental perspective on problem solving. Together they worked on audio amplifiers and repaired a Hallicrafter HQ-129 that his grandfather had acquired. Edward also let Rich use his metal lathe (he had to stand on a box to reach it) and sparked an interest in photography.

Rich had an unconventional and memorable first contact, although not as a ham. As a teenager he would buy military surplus gear and try to see what it could do. Some of this stuff was fairly obscure. He picked up some sort of transceiver and noticed it was keying every 13 seconds. He terminated the transmitter using a light bulb wired into the transceiver. One afternoon, while working on the circuits, he heard a knock on the front door. Upon answering he found two men from the army. This was during the Cold War when Pittsburgh (where he lived) was ringed by Nike-Hercules missiles. Every time Rich transmitted, he was jamming a section of the army's search radar. The two army men *strongly* encouraged Rich *NOT* to transmit on this rig anymore. He promised, and removed the output tubes.

In college Rich had a double major in Physics and Biology. After graduating he went to work at Carnegie-Melon, his alma mater, designing computers for the Computer Science Department. This was in the mid-1970s when computers were up and coming in a big way! He worked on some DARPA projects involving speech recognition, and designed the hardware and software for a computer-controlled recording studio.

After Carnegie-Melon, Rich went to Digital Equipment where, over the years, he worked in many capacities as a Senior Consulting Engineer. One of the most interesting was when Florida Light and Power, a Digital customer, was having problems with lightning repeatedly zapping their network adapters and computers. Rich spent a year working at the University of Florida's lightning lab, then went on to set up and run Digital's Lightning Consultant Practice.

In 2009, after perusing some FCC rules and taking some practice exams online Rich decided to go for his HAM license. He passed the Technician, General, and Extra exams at one VE session!

After becoming a ham, his favorite rig was a Kenwood TS-820 hybrid—mostly solid state, using vacuum tubes for output. It died a horrible death when the power transformer went. He ended up selling the reusable pieces and chucked the rest. Nowadays Rich lives in a small apartment where space and stealth are issues. He has a j-pole in an attic space and runs an Alinco DX-79 and a 2-meter Icom IC-229.

His current project is designing and building a 160-6m (and hopefully 2m) transceiver. He has built a Norton RF preamp similar to those used in radio astrometry to use with it. More about this project will be presented during upcoming RANV meetings and in the RANV newsletter.

Decibels cont.

Well, occasionally we will see dBm used in place of the familiar microvolt numbers. All you really need to remember is that -120 dBm is right around .23 microvolts which is decent enough receiver performance for anyone. Here's a handy chart if you are curious: wa8lmf.net/miscinfo/dBm-to-Microvolts.pdf

Lastly, as a curious historical aside, in the VERY early days of the Japanese consumer electronics invasion, they sometimes released receiver figures in something called ssG units, or dBf. These were usually positive units, so WTH? Well, instead of using the familiar milliWatt as the reference unit, they used the femtoWatt as the unit of measure. Instead of being 1/1000th of a watt, the femtoWatt is 1/1000,000,000,000,000th of a watt. So 1 femtowatt = -120 dBm. An ad for a vintage Sansui stereo receiver shows a value of 11 dBf as its sensitivity spec, or roughly 1.95 microvolts. I remember seeing these weird receiver specs on some vintage Icom gear I had, back when they called themselves Inoue Communications—and that was a VERY long time ago.

Hopefully I helped remove some of the mystery surrounding some terms we use very frequently as hams. As always, feel free to email me if something I said doesn't quite make sense.

73 de Bob W1ICW



Rich's other hobbies beside anything electronic include photography—both digital and film—and watercolor.

Like many hams, Rich is not afraid to experiment and take chances to achieve a goal. He is always willing to learn new things and give 'em a try.

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 KD1R@arrl.net or the GBA ARRL VE Team website at BARCVT.net



RANV

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NEWS & VIEWS

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- Member Profile: W1ELL

Upcoming, Notices, & Other Misc

- RANV: December Meeting—Party
- RANV: November Elections—11/8
- 2011 SET—Sat., 11/26, 9–12
- Steering Wheel: 3rd Tues, 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
www.RANV.org

NEXT MEETING

TUESDAY • NOVEMBER 8 • 7:00^{PM}

O'Brien Civic Center
113 Patchen Road • South Burlington

“Broadcasting”