



# Radio Amateur News & Views

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## RANV HOLIDAY PARTY

Join Us December 8<sup>th</sup>  
For An Evening of Fun

The **RANV** Holiday Party will be Tuesday, December 8<sup>th</sup> at the QTH of W1SJ in Essex. Festivities will get underway at 5:30 and will run until 10:00. Arrive at any time, but no food guarantees are made if you show up late! If you need directions, contact W1SJ at [w1sj@arrl.net](mailto:w1sj@arrl.net).

Our motto this year is *Rare DX*. We want to see those rare DX members who have rarely or never attended the party. And we want to see those rare significant others as well. This is a Party and we are supposed to have fun!

We have an assortment of food planned, including the usual cold cuts platter, cocktail franks, meatballs, egg rolls, fries, drinks and munchies. We'll also have an assortment of other tasty items, depending on what everyone brings. See below for more information on this.

There is no formal meeting and nothing specific is planned. Past activities have included the telling of tall tales, playing with computers, getting on the air, and viewing videos and pictures. Everyone is especially encouraged to bring non-ham guests as well. That way, normal people (*non-hams*) have people to talk to!

It is key that you let Mitch know how many are coming. If you haven't already, please let him know the number of attendees who are likely "definite" and the number of attendees who are likely "maybe". This information is needed *right away* so that the proper amount of food can be ordered. If you don't say anything, there will be no food for you! If you would like to bring something, let Mitch know that, too. If it is a food dish, you should come around 5:30. If you plan to arrive later, bring a dessert item. The best way to pass this information along is by using the **RANV** Holiday Party Survey form, found at: [www.ranv.org/partysurvey.html](http://www.ranv.org/partysurvey.html).

We look forward to seeing all of you at the Party!

## COMING UP!

The big item this month is the **Holiday Party** in a few days and I hope a lot of our members and their families can make it.

This weekend is the **ARRL 160 Meter Contest**. There are two challenges here: a long antenna is needed and this is a CW only contest. Why not try this out – it would be a tremendous challenge to make some contacts on a very different band and different mode.

The week after (*December 11-13*) is the **10 Meter Contest**. We cannot promise much here due to the low sunspots, but there are two good pieces of news. First, things are better than last year and second, 10 meters can open up big at any time with sporadic-E skip. Turn the radio on and listen all weekend and you might be surprised! Be sure to get on 7 PM Friday on 28.425 MHz as that is where all the local hams will congregate at the beginning of the contest.

Each year, we have our **Winter Breakfast** in mid-January. Besides eating, we carry on an organized discussion on the state of amateur radio in Vermont. Folks are buzzing about this, so I'm sure we'll do it again, although we are working on a venue change. Proposed dates are Saturday January 16<sup>th</sup> or 23<sup>rd</sup>.

There are lots of small contests in January and February to keep you occupied during the cold months. Of interest to everyone is the **NA QSO Parties**: CW on January 9<sup>th</sup> and phone on January 16<sup>th</sup>. This is a 10 hour, low power only contest, which is just the ticket for the less than serious contester. And the **CQ World-wide 160 Meter Contest** is January 29<sup>th</sup> CW and February 26<sup>th</sup> phone. The phone contest is quite a hoot and is the same weekend as **HAM-CON**.

Speaking of **HAM-CON** – be sure to be there at the Hampton on February 27<sup>th</sup>. Keep an eye on the Web site for new developments.

# OUR LAST RANV MEETING

by Carl AB1DD, Sec'y

The November meeting was called to order at 7:04 by President Brian N1BQ. There were 24 members in attendance.

The first order of business was that of newsletter editor. Mitch W1SJ announced that February will be his last newsletter as editor. A search will be launched to find a new one.

A new member, Bill WA1GRR was introduced. Welcome, Bill.

Paul, AA1SU spoke next, thanking Brian for his leadership as President.

The December meeting will be at the QTH of W1SJ and W1DEB. Please let Mitch know if you will be attending, and what you will be bringing to eat!

Jim KE1AZ will be bringing the snacks for the January meeting.

Next, we held our annual elections. The proposed slate won with 23 votes, with 1 vote for other candidates for each office. The new officers are: Bob KB1FRW President, Carl AB1DD VP/Treasurer, and Jeff N1YD Secretary.

Field Day results were announced. Vermont did real good, with MOO and RANV taking the top two spots in 2A nationwide. Both groups also placed within the top 20 nationwide in all categories.

HAM-CON is scheduled for February 27<sup>th</sup> and is in the planning stage. We need ideas for forums and any other activities. Please forward them to Mitch.

The speaker for this meeting was Mike KB1MDA. The topic was propagation and sunspots. Even though Mike couldn't guarantee that sunspot activity would increase rapidly and soon, he did give some insight on what was happening. He started off with some basics as to how the ionosphere reflects radio waves and how the sun is supposed to make this happen. He went on to explain what some of the other phe-

# PREZ SEZ

by Bob KB1FRW, President

The RANV election has brought a change. Brian N1BQ stepped down as President after leading the club since mid-2002. That was quite a run Brian - seven and half years! Thank you for your service, enjoy retirement and hope to see you at the Steering Wheels. There was a high turnout for the election. It was good to see the high interest even with the results pretty much pre-determined before the ballots were cast.

Now the baton has been handed off, I hope that we can help the club continue to flourish in the coming year. We have been working on more meeting ideas, securing presentations like Software Defined Radios, Lightning II, a DXpedition movie, Spy Radios and possibly the Border Patrol. We also have published a brochure to give to new hams that provides some direction into the hobby. Jim KE1AZ, has done a nice job setting this up.

The Holiday Party at Mitch W1SJ's QTH is only a few days away, on the regular December meeting night. Make sure you let him know you are coming and what you might bring.

The biggest issue facing the club now is the retirement of the newsletter editor, Mitch, W1SJ who has been the editor of the newsletter a long time (17 years). Thank you for your service Mitch, it has been greatly appreciated. His last issue will be February, 2010. This leaves us at a bit of a crossroads about the direction the newsletter should take. There has been a bit of trouble getting enough

nomenon effects propagation. Mike pointed us to a good web site <http://solarcycle24.com> that has a lot of information about what is happening up there now.

On another note, this will be the last meeting minutes that I'll be writing. It's been an interesting trip, and let's all welcome Jeff N1YD as Secretary and RANV's newest officer!

articles submitted which brings up the question of whether the membership as a whole wants the newsletter to continue. We need to hear from you on this. I posted a message on the Yahoo groups list addressing the newsletter issue and I saw only 9 replies! That is pretty low considering the club has some 116 members, with over 50 on the reflector. It is your club and it will be what you make it!

The discussion boils down to this: 1. Do we want a newsletter? 2. It takes time and money to produce. 3. It helps club members to be reminded of club activities and stay connected with the local ham community. 4. We need suggestions and help. If the newsletter is to continue, we need new editors, people to submit regular articles, new ideas as to how to produce and distribute it and content suggestions.

We have an excellent means for discussion on the Yahoo groups reflector. If you haven't already, please join the group. Details on how to do this can be found at the RANV web site.

## Contacting RANV

In Person: Holiday Party at W1SJ  
December 8<sup>th</sup> 5:30-10

By Mail: PO Box 9392,  
So. Burlington, VT 05403

By Radio: 145.15 repeater

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Editor: Mitch W1SJ 879-6589  
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Please send submissions for the newsletter to the editor, W1SJ.

# GRID LOCK - Minimizing Power Distribution Losses

By Jake WA2MDF

I found Brian N1BQ's article, "Batteries: Inside the Box" very interesting. As the owner of an off-the-grid solar photovoltaic (PV) home and an engineer at a local electrical power utility, I thought that I might expand on this subject with additional background. Because my PV home is over a mile from the nearest drivable road, with supplies carried in by back-pack or sled, I have to be especially mindful of maximizing energy efficiency of all types.

Your local electrical utility is also mindful of power ( $I^2R$ ) losses. In Vermont, average statewide distribution losses (*utility to customer*) will range from 9% at off-peak times to over 13% during summer peak usage. One way to evaluate distribution efficiency is to track a parameter called Load Factor.

Load Factor definition is:

**Annual KWH / (Peak KW x 8760)**

Where KWH = Total annual Kilo-watt Hrs; Peak KW = highest average KW over any 15 minute period; and 8760 = total number of hours in a year.

A perusal of this formula will tell you that load factor cannot technically ever be higher than 1.0. Also, the closer your load factor is to 1, the more evenly spread out your consumption of electricity is throughout the year. As mentioned in Brian's article about his 2-stage water system, if you can avoid running high loads concurrently, you will reduce your power losses.

The utility charges customers extra for their poor Load Factor through something called a "Demand Charge". This would typically affect only the larger commercial customers. The higher your peak KW, the higher your demand charge.

This shouldn't be confused with the term "Power Factor Charge", which is another component of electrical distribution losses. Power Factor losses are due to an effect very familiar to hams. It is analogous to RF feed-line losses due to reflected power in a transmission line, when the feed-line impedance does not match the antenna impedance. In the utility case, the impedance of the customers building load at the point of connection of the revenue meter does not match the impedance of the utility's electrical grid. This causes a circulation of currents in the power feed lines to the customer that lowers the useful current capacity of the copper without itself doing any useful

work. The utility monitors Power Factor via the electrical meter and charges the customer on a monthly basis based on their average power factor - if it drops below a prescribed minimum amount (*often 90%*). Again, only the larger commercial customers are likely to be charged extra based on this type of loss. Since low Power Factor is often due to inductive loads within a building, it might be of no surprise that power factor issues can often be fixed with the installation of carefully sized power factor capacitors.

If wholesale power costs were the same regardless of the time of day, or the time of year, then the optimization of power usage would be more straightforward. However, as many people are aware, power that must be purchased by the utility during Peak Hours (*usually daytime hours during week-days*) is often substantially more expensive than that same power bought during early morning hours or during the weekends. To reduce power purchasing costs, it is to the utility's advantage to encourage customers to use more off-peak power and less on-peak power. This is often done through Time-of-Use rates: you as a customer will pay more for power consumed during those expensive hours. We will all hear more about this in the near future.

How does all this relate to off-the-grid Solar PV? Such a PV system is its own self-contained unit consisting of power generation, distribution, metering and customer loads. In this case, the cheapest power is obtained during daylight hours, usually centered around the 10AM to 2PM timeframe. Power used during the darker hours is more expensive due to the additional losses incurred. As Brian mentioned, when using the battery bank to supply loads there are losses associated with converting electrical energy into stored chemical energy in the battery and then back again. There is also additional energy lost in the battery wiring ( *$I^2R$  again*), which tends to circulate higher currents because of the lower DC voltage. And the fewer times we cycle our batteries, the longer they'll op-

erate without the need of replacement. So our solar PV supply system is happiest when it can send power directly from the solar array to the load without having to interact with the battery at all. Our "off-peak" lowest cost energy in our PV grid is available during the daylight hours, especially on sunny days.

Looking at Brian's two-stage pump example again, there would be an advantage if the second stage water storage, the cistern, was adequately sized to provide enough water for a full day's usage. The 120 volt AC pump in the shallow well 300 feet away requires 40 amps of low voltage DC to run. If this pump were timed to only run during daylight hours, when it could be supplied partially or fully directly from the output of the solar panels, then the losses associated with battery usage would not be incurred. The cistern could be filled once during the day, and drawn down using the second pump, only, during the evening and night hours. Over years of daily use, the reduction in losses and battery charging cycles could be significant.

Charging of small rechargeable batteries in a rapid charger also can have its advantages. My solar home is wired with both 120 volt AC and 12 volt DC outlets. Many of my loads are 12 volts DC, such as lights, stereo, some ham gear, electric refrigeration, etc. It is not necessary for me to run a 120 volt AC inverter at all hours in order to utilize the power of the battery bank. This avoids the overhead of running the inverter during times when I only need to power smaller 12 volt DC loads. During my off-peak, cheap, sunny hours, when I tend to have a surplus of energy, it is a good time to power up the inverter and quick charge any small batteries during the peak hours of sunshine. Certain  $I^2R$  charging losses are higher, but they are offset by an overall lower system cost of energy. In fact, in the PV driven home, sunny hours are great times to do other chores that use energy, such as vacuuming or running a washing machine. Single phase 120 volt motors are notoriously inefficient! This is the same kind of sunny-day planning that used to be done years ago when solar-powered dryers (*clothes-lines*) were still in use. Hopefully, some of these efficient habits can now begin to be brought back.

A remote solar PV home provides a great education on self-sufficiency. It is surprising how easy it is to adjust to NO utility bills, ever - while living in warm comfort at any time of the year.

**RANV HOLIDAY PARTY!**  
**Tuesday, December 8<sup>h</sup>**  
**5:30 - 10:00 PM**  
**W1SJ QTH**

**RANV**

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