Radio Amateur News & Views

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ELECTRICITY 101
A Visit to Green Mountain Power
The September 9th RANV Meeting

For our September meeting, we will take a Field Trip to Green Mountain Power's Corporate offices in Colchester. Ken Couture, Engineering and Control Center Manager will give us a presentation on the basics of the AC Power Network. He will discuss how alternating electrical power gets from the generation facility to your home, including a discussion on "When Things Go Wrong". Maybe there are some lessons to be learned by the operators of **RANV** Power & Light, our Field Day generating division. If the controllers are not busy with system problems we may get a tour of the control room also.

The meeting is a request of **RANV** member. Thanks for the suggestion and keep them coming!

The meeting will be at 7 PM at Green Mountain Power's corporate offices at 163 Acorn Lane, Colchester. To get there: head north on Route 7 from I-89 Exit 16 *(near Costco)*, travel ½ mile and take a left turn at the traffic light on to Rathe Road when the two lanes reduce to one. Go 0.1 mile on Rathe road and take a right on to South Oak Circle. Go about 400 feet and take a left on to Acorn Lane. Travel about 1000 feet and Green Mountain Power is the last business in the park.

HAM CLASS

The next Ham Radio Class will be Saturday, October 4th. This is a one day Technician class, meeting 8:30 until 6:00. The growth of amateur radio has dropped to very low levels. It is up to all of us to get people interested and into classes.

Getting a Technician license is a lot easier. The syllabus was changed, eliminating most of the technical questions. The course prepares the students for the exam, and also for what to do when they get the license.

A General course will be held on Sunday. Students can take both courses or Technicians can take the General course. There also is an online course for Technician, General and Extra it you can't make a class.

Contact Mitch W1SJ at 879-6589. for details on enrolling.

COMING UP!

Our Fall Ham Season is upon us and there is plenty to do! The weekend of September 13-14th, is the *VHF QSO Party*. Get those 6 and 2 meter SSB radios out and get on the air. Monitor around 50.125 and 144.200 MHz and you will hear something. I plan to be on Mt. Equinox and will swing the beams north at the top of the hour. If you can't find anyone on SSB, then call CQ on 146.55 FM.

We will have the first of several exciting **RANV** meetings on September 9th, when we will take a field trip to Green Mountain Power. Details appear above. We will follow that up with meeting on House Wiring and Safety on October 8th.

Get those potential new hams signed up in the Fall Weekend Class on Saturday, October 4th! Or else, if you are a Technician, come to the General upgrade class on Sunday.

Near-Fest will be later this Fall on October 11-12th. That's the last hurrah for hamfests this year, so be sure to come on down!

FOX HUNT ANYONE?

It's been a long time since we've had a Fox Hunt. I just competed in the hunt at Boxboro and had a ball. Since activity at hunts has been low and burning up a lot of gas is not all that politically correct anymore, let's plan on a 3 hour event on a weekend afternoon. We'll hide 4-5 transmitters around a designated park and then the hunters can go to town. To make this happen, we need 5 hunters and need to agree on a date in late September or October.

OUR LAST RANV MEETING

by Carl AB1DD, Sec'y

The meeting for August was our annual picnic, held at Kill Kare State Park at the end of Hathaway Point in St. Albans. There were 14 members and guests attending. There was a wedding reception setting up in the same spot we wanted, so we moved a little to make room. The first task was to get an antenna in the air before too many people arrived, making archery a risky sport. After a couple of shots, the tag line was looped over a branch around 80 feet up in the air. Some pulling, untwisting, then some more pulling and untwisting got the vertical dipole all the way up into the tree. The transceiver and amp were connected and powered up, and W1V was on the air. Some members got on the air and made contacts. One contact of note was with K1SW, who was camping on Burton Island, just a stone's throw from Kill Kare! Our W1V operation was an opportunity to get on the "other end" of a pile-up. In the meantime, Brian N1BQ arrived with the refreshments and charcoal. The BBQ was fired up, and people got their burgers and tube steaks on the fire. There was plenty of food and no one went hungry.

After lunch, Mitch W1SJ hid a fox box somewhere in the park and we had an impromptu Fox Hunt. There was a report from the Burton Island ferry boat crew of someone running around with a cowboy hat and some electronic stuff pointing an antenna all over the place. Was that Jeff? I did explain to them what was going on. I think they believed me.

At 3:30, with W1V running in full swing, it began to rain *(as it does every day this summer)*. That caused a quick cover up of the station. With the rain increasing, this was followed by a quick dismantling. This also signaled the end of the picnic. Everyone had a good time, even if the picnic was shortened by an hour.

GET ON THE AIR!

by Mitch W1SJ

Activity on the air seems to be at a lull. Why don't we change that? Let's set aside a time each week when we all turn on the radio and get on the air. Now this isn't a net I'm proposing. Instead it is an "activity hour" which we all can target or allocate time so that we all are at the same place at the same time.

When is a good time? Dunno. Everyone is so darn busy, it is hard to say. It is a foregone conclusion that weekdays are out, unless we are shooting for a retirees group. And weeknights are pretty bad too, since everyone is tied up with something. And mid-day weekend's are probably a bad idea too. That leaves Friday night, Saturday morning, Saturday night, Sunday morning or Sunday night.

Friday and Saturday night are nights many people go out. However, how socially active is our group anyway? For me and others, I am often away on weekends. Saturday and Sunday mornings might be good, as long as the festivities get done by 11 or so. Folks usually have plans during the day, but can squeeze in some time in the morning. Sunday night is a popular time for many nets. Few other activities are scheduled Sunday night and more people are back from weekend travel. But we must decide this as a group. So, if you are interested in this activity, let me know *(via E-mail)* which time works best.

So what do we do when we are all on the air? We do what hams do best – talk! We don't need a roll call, we don't need a particular topic and we don't need to drone on endlessly about the crappy weather. I keep hearing about new hams who have questions but don't know who to ask. Well, this would be a good place to try. But, we needn't limit the discussion to techie topics either. Some folks like to sit on the side and say nothing, until a topic interests them and then they are right there.

The 145.15 repeater is probably the easiest way for all of us to communicate. Should this become successful, it is easy enough to include other repeaters via our IRLP and Echolink facilities. And if the group should get large enough, we could have splinter groups running down to HF to conduct research and development there.

We all worked hard to get our licenses and build our stations. Let's have some fun now!

Let me know what days and times you would like to try this. And if I get very little fan mail, well, then you have voted this idea off!

Remember: Foward your ideas about an activity hour and fox hunt to W1SJ

Contacting RANV

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

HAM RADIO GOES TO COLLEGE

by Stuart ND1H

A buddy of mine from my childhood, Bill, inspired me to get my novice ticket when we were teenagers. We took the test on the same day; I got WB2PBH and he got WB2PBJ, so there was only one person between us in the paperwork

He's now a college professor with a new call, KC8WBD, and he's found a very clever way to integrate ham radio into the electrical engineering, computer engineering and computer science curriculum. Bill has his students undertake practical projects involving software-defined radio (SDR).

Many modern communications systems are based around SDR architectures. Put simply, the focus of SDR is to substitute software for many of the traditional circuit-based systems of a radio. Not only the user interface, but much of the audio and radio circuitry as well, can be implemented using software. Of course, certain hardware portions remain, such as up-and-down converters for transmitting and receiving, respectively, as well as A/D and D/A circuitry for moving between the analog and digital realms.

The beauty of using SDR for these projects is that they allow engineering students understand how their work is part of a larger systems development effort and why interdisciplinary understanding is crucial to produce real solutions to very real problems. The electrical engineers have to understand the traditional RF front end, power, and other circuits as they have for decades, but also have to think about where and how to provide an interface to the processing software. The computer engineers see first hand how any shortcuts in computer system design can wreak havoc on nearby receiving equipment, and how skillful waveform processing is needed cleanly provide a digital representation of an analog signal. The computer science majors learn how important clean coding is to ensure that software processing of waveforms happens quickly enough and seamlessly enough to result in a robust radio system, as well as how important it is to provide human interfaces that make sense for those transitioning from legacy types of transceivers.

Bill has set it up so that groups of six undergraduate students, two each from computer science, electrical engineering and computer engineering divide up based on their field of study but also meet weekly to ensure that each discipline understands the needs of the others. To give an example of how they need to work together, a typical exercise uses what's known as a Tayloe detector that converts received RF signals into audio frequency in-phase (or I) signals and out of phase quadrature (Q) signals, both of which are fed into a personal computer using its sound card. To make things more interesting, the sound card of the PC that is used does not have stereo inputs, so an early step is to figure out how to get those signals into the computer (a computer USB audio device with stereo input provides the answer to that).

The conversion from the I and Q signals into audio is performed entirely in software using various Fast Fourier transforms, inverse transforms, and filtering techniques as are applicable for the type of modulation, which can include CW, AM, SSB and FM. For FM reception, for instance, the I and Q data representations are processed to determine instantaneous phase, which can then be processed back to the modulating audio.

Among the most important lessons for the students is how to avoid reinventing the wheel. For instance, some prepackaged components may be suitable for use in SDR while others may be too slow or inconsistent. Windows Medial Player 10 was found to allow fairly complex "plug in" capabilities so that the students could write code to operate with Media Player to implement a portion of the radio.

The students Bill is working with are juniors and seniors, and have already taken a number of courses in signal processing, communications theory, control systems, programming, computer interface circuits and the like.

Bill has made ham radio a large part of the focus of this SDR work. While the radios that have been worked on have included commercial broadcast and public service receivers, a primary focus seems to be on ham receivers and transmitters. He's encouraged many of his students to get their ham radio licenses, and they have tested their systems by having one student transmit over the ham bands to another. After tackling AM, SSB, CW and FM, future work is to incorporate digital transmission under PSK-31, and Bill and I have discussed plans for integrating APRS functionality as well. Flexible, portable systems built around Pocket PCs are also queued up for future projects. In the broadcast area, High Definition broadcast reception is another area of ongoing interest.

Bill reports that students find the ham-based SDR projects to be particularly enjoyable. It's not clear exactly what makes these so much fun for the students, but some of the factors are that students get to see theory turned into a practical application, they get to mix their ham radio hobby with their schoolwork (and for some they have just picked up this hobby), and they get good experience in working outside their discipline with other people just like they'll have to do when they graduate and start working on real-world engineering projects.

I'm really impressed that my buddy from Kindergarten has come up with such a great way to integrate ham radio with college engineering and computer science education. I can't wait to see what wonderful radios these students develop ten years from now when they're working at Motorola, Icom, Kenwood or wherever!

NEXT MEETING:
"Electricity 101"
Tuesday, September 9th, 7 PM
Green Mountain Power
163 Acorn Lane, Colchester

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http://www.RANV.org