



Radio Amateur News & Views

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W1KR VINTAGE TELEGRAPH KEYS The February 10th RANV Meeting

David W1KR returns to the RANV podium to give us an update on Telegraph keys. Telegraph keys were very popular items, even before the advent of amateur radio. In the latter half of the 19th century and well into the turn of the century, the bulk of information sent around the country was by telegraph wires. Operators often owned their own keys and brought them when they went on shift at work. Since straight keys are limited in sending speed, high speed telegraphy work was done with semiautomatic keys, also known as *bugs*. With all of the electronic keyers and computers used today, bugs are not used all that much. However, bugs and keys are highly collectible and command serious money at shows.

David has presented variations of this topic in 2000 and 2002. Instead of buying keys and bugs, he *builds* them. To add a twist, he builds them in *miniature*. In the past, we saw several examples, including the start of a 1/2-scale *Vibroplex* Upright bug. David will show several of his completed keys and works-in-progress and offer up the stories that go with them. Even if you have never operated CW, the the examples of workmanship and David's storytelling are worth the price of admission.

Festivities get underway February 10th at the pre-meeting gathering at Zach's on Williston Road, after 6. The meeting starts at 7 PM at the O'Brien Civic Center, 113 Patchen Road, South Burlington, See you there!

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MILTON HAMFEST 2004

The 22nd annual Milton Hamfest will be Saturday, February 28th, at Milton High School.

Vermont's greatest ham radio show has everything the amateur operator, hobbyist and computer hacker would want: Priceless goodies, forums on the latest and greatest and demonstrations of the latest technology. And, our biggest asset - 500 or so individuals looking for and talking about the same things you are!

With thousands of square feet of indoor flea market area and scores of tables available, we plan on having another great flea market. The regulars will be there, bringing a whole bunch of radios and electronics. Many

basements get emptied into Milton and we all can share in the goodies. Come on down and buy something. The deals found at Milton are as good or better than anything found on-line! Nothing beats getting out on the floor and fondling the merchandise. Don't need anything? Then come out and look over the stuff. There are some great conversation pieces out there!

New this year is a special mode **Demonstration Station**, located in the Front lobby. This station will feature demonstrations of IRLP, Echolink and PSK-31. We will supply the station and a directory of addresses. Tell us where you want to talk and we'll dial it up for you right

OUR LAST RANV MEETING

by Bob, KB1FRW, VP

President Brian N1BQ called the meeting to order and welcomed everyone to 2004. Jeff KB1IWK, seconded by Don N1QKH, made a motion to appropriate up to \$500 to cover Milton Hamfest costs which passed unanimously. Don N1QKH, seconded by Bob W4YFJ, made a motion to approve \$60 for an ad in the *Vermont Amateur Radio Directory* which passed unanimously. While Paul AA1SU was out getting snacks for the evening, we voted to have him get snacks next month.

Brian reminded everyone that the Hamfest covers a number of club expenses and all members are asked to participate in the planning and execution of the event. Section Manager Paul AA1SU noted that the Section Manager nomination for Vermont is coming up and encouraged all League members to participate. Mitch W1SJ announced that he would be running a contesting training session during the *Vermont QSO Party* on February 7-8th. Brian announced that the *Freeze Your Butt Off* contest is February 7.

The main event was Brian N1BQ, discussing Software Defined Radios. Software defined radios (SDR) are different than software controlled radios in that the SDRs gets their operability (tuning, DSP and control) from software definable parameters whereas software controlled radios only get their control from software. SDRs have been in development for the last few years starting with Digital Signal Processing (DSP) and progressing to more sophisticated schemes that use basic generic hardware platforms to tune a wide spectrum of radio frequencies. These platforms are very configurable and through software changes allow a wide range of changes such as filtering and DSP implementations, the number of

THE PREZ SEZ

by Brian N1BQ, President

This has been a brutal winter but on the bright side I can say its given me more time to work on the mountain of ham radio kits I had on my to-be-done list!

And there is still much to be said for having a roaring fire in the woodstove, a mug of hot cider and trolling 40m CW on a quite afternoon.

The hamfest is coming! The hamfest is coming! Please come to

changes the end user can make are phenomenal.

Some examples of SDRs are: The PSK Warbler, an early example of SDR; the DSP-10 a sophisticated 2-meter radio and the SDR-1000, providing everything needed to convert a computer into a high performance, 160-6 meter amateur transceiver with general coverage receiver.

Brian then demonstrated the software for a Kachina 505DSP and tried to make a contact with his SDR-1000 but it wasn't meant to be. It later turned out that a radio to computer connection was not completely connected.

Mike N1JEZ gave a brief presentation of his DSP-10 that included some stunning examples of communications that took place down in the noise floor (what we hear as static). Part of the DSP-10's ability to pull out weak signals is due to its IF and audio that is defined in software (SDR) which allows additions and improvements. The DSP-10 is used for extremely weak signals, with very low data rates. Mike showed us a QSO that was copiable -26 db below the noise floor! He said the DSP-10 would work -36 db down!

We then all applauded Brian and Mike and headed for the snacks and then out into the frigid night.

the February meeting and sign up to help. It's your hamfest. Its success drives other RANV activities. Only you can make it happen with your presence and help. Get out and tell others about the hamfest and get them to attend so we can have another successful year.

The ARRL Board of Directors have voted to recommend to the FCC a restructuring change for amateur radio. It eliminates the code requirement for the General Class license, among other things. The details of this proposal are discussed on the next page.

The ham class John KB1JGH and myself are teaching is going well. We will have a VE Session Thursday, February 19th at 7 PM at the United Church of Underhill. We hope to have lots of new hams for the hamfest.

Don't forget the *Freeze Your Butt Off Contest* February 7th. We'll be back on the mountain, attempting to freeze our way to a new record!

Contacting RANV

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

PROPOSED HAM RESTRUCTURING

by Brian NIBQ

In what I am sure will be a controversial action, the ARRL Board of Directors voted in January to recommend to the FCC a further restructuring of amateur radio. Now, before too many people groan out loud, you must remember the restructuring of April 15, 2000 was acknowledged almost up front to be an interim step. The issue of Novices, Advanced and the Novice frequencies was considered unfinished. At that time the WARC 2003 decision to drop ham CW requirements was already considered inevitable.

The League has proposed eliminating the Technician, Novice, and Advanced licenses as they currently exist, and creating a new "Novice" license. The exiting holders of these classes would be folded into the new structure at appropriate spots. This new structure should be an easy sell to the FCC. Regardless of how you feel about the merits of the various requirements of this new structure, it will be far easier to administer.

The centerpiece of the proposal is the new Novice license with phone and CW privileges on 80, 40, 15, 10, 6, 2, 220, 440. There are frequency and power restrictions as well. The license requires a 25-question test. The Extra class license is essentially unchanged, retaining its tougher theory and the 5-wpm CW requirement. I will not bog down on the details of who gets grandfathered where. It is or will be available all over the web and print publications.

I think this is a good move. The League recognizes the realities of dealing with Washington bureaucracy and has proposed some, what it considers desirable, changes and made it more palatable by the simplification of the structure, making it easier to administer.

Now there will be those who feel this is a further "dumbing down". I don't feel this way because the size and breath of the current question pools are far beyond the scope of the tests from twenty or more years ago. Some say back then we didn't have published question pools as we do under the current VE system. That is often countered by those who remember the study guides that came out years ago based on querying hams post-test to recall as many questions as they could. It is an endless argument. It reminds me of being in the Marine Corps where old timers of all ages recalled how much tougher it was "back in the OLD Corps!"

I would ask you to consider this - we all know many hams who haven't touched a Morse key since they passed their tests. Under this new structure hams will get on the air and if they are interested in CW they will get into it. Again, personally, I feel we may get more hams actively doing CW this way than under the old structure. Only time will tell.

This is only a recommendation by the League. The FCC may ignore it or they may generate a Notice of Proposed Rule Making (NPRM) which provides you a chance to make public comment.

RESTRUCTURING NOT ENOUGH

by Mitch WISJ

The ARRL's restructuring proposal doesn't address the major problem in amateur radio today: *growth and retaining operators*.

The decision to drop the code requirement for the General Class license is a good one. General operators have proved their knowledge by passing two 35-question exams. Morse Code has become an unnecessary block in the process.

If that is where it stopped, this would be a great proposal. However, the ARRL Board attempts to fix something which is not broken. We do not need to make the exams simpler. Anyone who wants a Technician License can get it, with a little effort. Questions are available for review on-line for all. I keep hearing comparisons between today's 500-question pool and yesterday's 10-page study guide. To compare ham radio today with the 60's is unreasonable. There are a lot more modes and techniques used today. The equipment is more complex and the bands are more crowded. The so-called "easy" Novice study guide of the 60's required you to read questions in essay format and understand the concepts. Today, one can memorize the questions and answers if they so choose. Looking to the past gives us all a nice warm nostalgic feeling, but it is not the solution, or even a good idea.

The proposal to move all current Technicians to Generals is a slap in the face to Generals who have worked through the incentive system. The attitude I'm hearing is, "why should I take another ham test - I'll just get an automatic upgrade in a few years."

The sad fact is that the REAL problem is completely ignored. Amateur radio is losing operators in droves. In Vermont, one of the fastest growing ham states, we have lost 0.5% each of the last two years. In larger states, the losses are several percent. Where are these losses coming from? In Vermont, 71 amateurs (*about half*) who got their licenses in the new no-code Technician program in 1993 didn't bother to renew. A few were active, but most never bothered to obtain equipment. Maybe they were never really interested. Some 40 amateurs moved out of Vermont, many undoubtedly for economic reasons. Some folks moved to Vermont but not enough to offset the loss. And are we replacing these lost hams with new ones? No! The number of new hams is down dramatically. I used to get calls all the time about ham radio licensing and classes. Now, people are too broke, too busy working several jobs, and too busy talking on the cell phone. We've lost our appeal, I'm afraid to say. The sales pitch needs updating.

So, don't whitewash me with a lot of ham radio structuring nonsense, when the real problem is selling the ham radio package. We cannot stand to lose operators each and every year. Eventually, anything decreasing will approach zero. Long before that, commercial folks will ask for and get our valuable spectrum because we cannot justify its use.

We cannot wait for the ARRL to ride up on the white horse and save the day. It would be nice, but don't count on it. Instead, we do what we do as amateurs. We operate, we congregate in hamfests and we continuously promote our hobby all the time to all who will listen. For training, there are books, there are web sites and there are classes. Get people to check out the true joy and value of amateur radio by working towards a license. Share your enthusiasm and folks will flock to ham radio.

LOGBOOK OF THE WORLD

by Mitch W1SJ

The ARRL has brought QSLing into the new millennium with their *Logbook of the World* (LOTW) Program. The League has been under pressure for several years to move towards electronic QSLing, especially with the popularity of the *EQSL*. A big problem for the ARRL was ensuring that the program would not allow cheating or forging to maintain the highest standards for DXCC and other awards.

The program is very different than the *EQSL* system or manual QSLing. LOTW is, for all intents and purposes, a giant database. No QSLs are generated or sent or received. The program will be successful when many, many hams upload their logs into the database. The database compares QSO information, and when callsigns, dates, modes and times (within a window) match, QSL credit is awarded for the contact. Users

can then buy these QSL credits for around 25 cents apiece for various awards. No cards are printed or submitted in this system. The database only shows matches to your submitted logs; you cannot read anyone else's logs. Therefore, to use QSL credits, you have to submit a log.

Recently, I enrolled in the system and uploaded some 30,000 QSOs into the database. It is not a trivial matter to enroll or submit large logs. It took quite a bit of time. The first step is to download special software, called *Trusted QSL*. This software has two parts. The first part is a certificate application. The second part is for log uploading. The LOTW program requires each submitter to obtain a certificate for each call used. This certificate is used to verify that each QSO submitted into the system is signed and verified by your callsign, supposedly to eliminate cheating. Using the program, I applied for a certificate for both W1SJ

and WB1GQR, supplying callsign, name, callbook address, E-mail address, valid license dates and the first of many passwords. Since the ARRL doesn't really know if W1SJ is using the program, they send a postcard bearing a second password to the callbook address of W1SJ. This step is to verify the applicant. Three days later, I went to my post office box to retrieve the post card and entered its password into the LOTW certificate system. It accepted it and then I had to wait another day for the system to send me an E-mail with a third password. This password finally validated my certificate in my computer. Now, finally, after a week, I could upload logs. I subsequently obtained certificates for W1NVT and a couple of

callsign, date, country or band exists. So far, about 10% of the QSO's I have submitted have been awarded QSLs. That is because other stations submitted logs and there is a QSO match. For example, Ron KK1L submitted his logs. Wherever we have worked each other, a QSL record exists because our logs match for that QSO. In time, as more logs are submitted, more QSL credits will become available. The program is in its infancy right now, and the software to ferret out awards such as DXCC or WAS, etc. hasn't been written yet. So now, all I can do is admire my logs on the system and see how many QSL credits I can earn.

Congratulations to the ARRL for putting this system in place. It was long in coming. That being said, it

***“LOTW is, for all intents and purposes, a giant database.
No QSLs are generated or sent or received.”***

DX operations. These DX locations were reciprocal operations and it was easy to get the certificate. In other cases, LOTW requires the DX station to mail a copy of the operating permit, which is a real drag.

I couldn't just E-mail my logs as is. The LOTW system only accepts logs in Trusted QSL format. I don't know the intricate details, but I'm told each QSO record is formatted and "signed" with my certificate to validate it. The program will convert either Cabrillo log format (*used by contesters*) or ADIF format (*used by other logs*) to Trusted QSL format. The finished logs are either E-mailed to a robot or uploaded directly on the website. After a short time, an acknowledgement comes back and the QSO's are in the system.

To check my logs, I had to sign onto the LOTW system on the ARRL website, using a fourth password. There, I could see a listing of my logs. The ability to sort the logs by

has some serious shortcomings. While all of us demand fair play and a level of security in awards programs, there is a fine line of reasonableness. Make the system too easy and there are those folks who will cheat. However, make it too hard and many folks won't bother with it. The multiple step certificate process was discouraging. It required some E-mails and a phone call along the way to get me along. I am quite computer savvy. For those who are not, the process can be overwhelming or very frustrating at best.

The log conversion process is a major disappointment. Contest logs from serious stateside contesters can have 1500-2000 QSO's. DX contesters will have even more than that. I often have to convert my logs to another format and software exists which does a whole log in a few seconds. The Trusted QSL converter takes 10 minutes to convert one 2000-QSO log. This is ridiculous. It took hours to convert my logs. True, this program runs in the background of the computer, but it was tedious

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to start each job and collect the results and send them in. It really felt like 10 years ago when I processed logs on the original (*and deathly slow*) 4 MHz PC. I spent the better part of three days dealing with software installation, applications, passwords, log conversion and upload. I happened to have the time on my hands then, but many folks do not.

If we like to look ahead many years to the future, then applications for DXCC and other awards will not require any physical QSL cards whatsoever (*and no card checkers either*). I started to think about this and realized that the cost of buying QSL credits from LOTW can be prohibitive. If one were seeking DXCC and wished to buy all 100 QSL card credits at the discount price of 20 cents each, that is a \$20 investment, plus the DXCC application cost. However, a lot of us are looking at 5 or 6 band awards. That would add up to over \$100 in award credits. While I can understand the need for the ARRL to subsidize the cost of setting up this program, it shouldn't be prohibitive to the point where some would say, "no thanks". As the program grows, one would expect that the cost will drop.

Right now, some of the big contesters and DXers have uploaded logs. Many have not yet. As I mentioned before, for LOTW to be successful, many have to upload logs. It is a benefit to all when this happens. Many will not bother, due to the hassle and time investment needed. The ARRL needs to streamline the process so that security can be assured while program application and upload is quick and painless. That being said, I urge everyone to take the time to upload logs and provide constructive advice to the ARRL so that the program can be improved.

ANTENNA LEGISLATION IN VERMONT

by Paul AAISU, Section Manager

On behalf of State Government Liaison, Dave WIDEC and myself, we are pleased to announce that we have introduced PRB-1 Legislation into the Vermont House. It is called H.602. PRB-1 is a 1985 FCC ruling that states local zoning ordinances must reasonably accommodate Ham Radio antenna support structures. This was designed to be a guide for all states. So far several states have passed PRB-1 Legislation. In our Bill, we make it clear that we are not talking about telecommunications towers. Rather we explain why we might need an antenna to be above the house in our yard and some of the things that we do for the community.

We need you to contact your local Legislators and ask them to support and/or co-sponsor House Bill H.602. It was introduced recently by Ira Trombley of Grand Isle. Ira is related (*by marriage*) to Mike Raisbeck K1TWF our ARRL New England Vice Director. It was then referred to the House Local Government Committee. We need to get it out of Committee and onto the House Floor. Representative Trombley has just testified on our behalf in front of the Committee, so things are moving at a fast pace. Time is of the essence because next it has to make Crossover around the middle of the session, and then go to the Senate.

We will be sending out a fact sheet about Bill H.602 that we want you to use as a guide. Since attachments cannot be sent via this method, it will be sent separately. When it arrives, please forward it (*without headers*) to your local Legislator. Next print it out and mail it to them. Follow this up with a nice phone call. Finally, send a QSL card with a note asking him/her to support H.602. With all the mail that they receive, a QSL card will stand out because it does not look like anything else. If you didn't receive the attachment, drop me a note at aa1su@arrl.org and I'll send it to you.

To find your Legislator and all their contact information, go to www.vermont.gov and click on "How do I Contact My Legislator?" To track the progress of the Bill, click on <http://www.leg.state.vt.us/database/status/status.cfm> and type in H.602. From there, you will also be able to see a copy of Bill H.602 as introduced.

I want to thank Trevor Lewis KD1YT for drafting the Legislation. Trevor is Vermont's only ARRL Volunteer Counsel and has worked very hard to help put this together.

In addition to all of this, a nice thank you note and words of encouragement to Ira would be a good idea too. Here is his information from the web site: Trombley, Ira, 94 Pearl Street, Grand Isle, VT 05458, phone: 372-4030, E-mail: itrombley@leg.state.vt.us.

Thank you very much for your help and support on this very important topic. This Bill, by the way, does not cost the state one-cent to maintain and it clarifies the issue so well that it will prevent costly court battles in the future. Our neighboring state of New Hampshire recently went through a costly battle and lost to the hams. They now have PRB-1 Legislation and things are going more smoothly there.

VERMONT QSO PARTY

The Vermont QSO Party will take place this weekend. The event starts 7 PM Friday, February 6th and ends on Sunday February 8th at 7 PM. Get on and make lots of contacts. For the most part, the QRM will be low and anyone with a decent signal should do well. Running along with the Vermont Contest will be the 10-10 Contest (*hopefully, 10 meters will open*), QSO Parties in Delaware and Minnesota and the NA Sprint on Saturday evening. You simply give out signal report and county. You collect states, provinces, DX and counties in Vermont, New Hampshire and Maine. Details are at <http://www.ranv.org/vtqso.html>.

Milton... continued from page 1

on the repeater. We also will show off how great PSK-31 works. With low power and a small antenna, we hope to work all over.

For its size, Milton offers the best forums program anywhere. We've added even more this year. Look at the schedule carefully and plan your attack. Forums start early at 8:30 and run all day. The day will go fast!

Ed Hare W1RFI of the ARRL Lab will be our guest again this year. He will be giving two GREAT forums in Room 1. He starts off at 8:30 with the **Antenna Modelling Forum**. Anyone who enjoys designing and building antennas will love this forum. Ed will describe how you can use your desktop computer and available software to design an antenna which, as we like to say, "kicks butt"! Ed returns at 9:30 for the **RFI Forum**. The topic of the year is HF Interference caused by *Broadband Over Powerline* (BPL). We have heard all sorts of dire predictions of interference if and when BPL is established. Ed will sort out the fact from the fiction.

At 9:00, over in Room 2, a new forum this year is **Techniques of the Best Operators** by Mitch W1SJ. Ever wonder what someone does to be a great operator? How do operators crank out hundreds of QSO's hour after hour? Mitch will offer up some of the family secrets in a forum which has run many times in Dayton.

At 10:00, Mike N1JEZ will host the **Satellite Forum**. The big news this year is the impending launch of AMSAT-Echo. This is an amazing satellite with many capabilities, all contained in a 9 inch cube! The most interesting piece is that the satellite will be launched by a recycled Russian ICBM! No foolin'!

In Room 3, Brian N1BQ will be hosting two forums. At 9:30, he will bring back the popular **QRP Forum** where attendees can share stories and show & tell items. Following at 10:30 will be **APRS Forum**. Brian is one of the foremost authorities on the Automatic Packet Report System – you can track him in his truck all day long on APRS! After a short introduction, updates on what's new in APRS will be presented.

At 10:30, we go back to Room 1 for the **ARRL Forum**. There you can get to meet and greet (*and perhaps grill*) ARRL New England Division Director Tom Frenaye K1KI, Vice Director Mike Raisbek K1TWF and Vermont Section Manager Paul Gayet AA1SU. The BIG news is the ARRL proposal on amateur radio restructuring. Tom will give all the details and background on this important news item, followed by adequate time for questions and discussion. Paul will update everyone on efforts to pass PRB-1 antenna legislation in Vermont.

The **Yankee Clipper Contest Club Forum** will start at 11:30 and will be hosted the YCCC. The details are still being put together, but some of the topics for presentation might include contest station building, logging software, second radio operation and operation from DX locations.

The **Volunteer Exam Session** will be offered at 12 noon. Candidates are reminded to bring a copy of their license, CSCE, pen, pencil and \$12 (*cash only*) exam fee. Commercial exams will also be offered in the afternoon session. Contact Mitch W1SJ for details on the commercial exams.

Milton will have QSL card Field Checkers available to check your DXCC or WAS cards without having to mail them to the ARRL. Consult the ARRL Web site or contact W1SJ for details.

Milton is a great place to take care of business. Go to the **RANV** table to join or renew. Pick up a copy of the new *Vermont Amateur Radio Directory* or perhaps a back newsletter. We'll also have an assortment of license manuals for the prospective ham.

Also be sure to take the opportunity to meet the many members of the Vermont ARRL Field Organization. Most will be on hand. Many of the forum speakers will be around all day for questions.

Finally, and most important, we need help! Volunteers are needed to staff the entrance doorways, to staff the club information table and to help set up on Friday night. You don't get paid, you don't get free admission and you don't get a free lunch. But, volunteering is fun!

HAM CLASSES by Mitch W1SJ

The next Weekend Amateur Radio Class will be on Sunday, March 21st in Essex Junction. This is a ONE-day class to earn the Technician Class license. Upon pre-enrollment (*required*), you receive a course book, and workbook. Specific readings and exercises get you ready for the one-day class. The class is 8:30 until 6. Exams are given at the end of class.

For students just wanting to get a taste of amateur radio without jumping in totally, the **Technician Class** on March 21st is just the right ticket! But for students who really want to jump in and go right to **General Class**, they take the March 21st class and come back a week later on March 28th to finish the General. Then, they spend a few weeks learning the code and they have the valuable General license. Pre-enrollment is required for all courses and a package of the appropriate study material is sent out prior to class.

It is OUR JOB to recruit new amateurs. If you read the article on amateur radio growth elsewhere in this issue, you know we can do better. By sharing our excitement and love of amateur radio, others will be excited about it. Get your friends interested and have them consider taking the class, or getting study material.

For information on the weekend class, contact Mitch at w1sj@arrl.net or at 879-6589.

NORTHERN VERMONT
WINTER HAMFEST

ARRL VERMONT STATE CONVENTION

MILTON, VERMONT

SATURDAY, FEBRUARY 28, 2004

NOW IN ITS 22ND GREAT YEAR!
NEW ENGLAND'S BEST AND BIGGEST WINTER HAM RADIO SHOW!

FLEA MARKET

Tables & tables of Goodies!
 New and Used Radio Sales
 Book Sales at Radio Bookstore
 VT Amateur Radio Directory
 Connectors, radios, computers
 Tables FREE while they last

FORUMS

8:30 Antenna Modelling
 9:00 Operator Techniques
 9:30 RFI Forum: BPL
 9:30 QRP Forum
 10:00 Satellite Forum
 10:30 ARRL Forum
 10:30 APRS Forum
 11:30 Contest Forum

ACTIVITIES

VE Sessions 12 Noon
 Commercial Exams 12 Noon
 IRLP and PSK Demo Station
 RANV Information Table
 ARRL QSL Card Checking
 Coffee, Donuts & Sandwiches
 & all those eyeball QSO's

ADMISSION \$5 UNDER 18 FREE

TALK-IN:
 WB1GQR 145.15- Rptr
 W1NVT 146.67 Beacon

DIRECTIONS:
 MILTON HIGH SCHOOL, ROUTE 7
 I-89 Exit 17, Route 7 NORTH 4 Miles
 I-89 Exit 18, Route 7 SOUTH 5 Miles

FOR MORE INFO:
 Mitch: (802) 879-6589
 w1sj@arrl.net
<http://www.ranv.org>

**NEXT MEETING:
“W1KR Vintage Telegraph Keys”
Tuesday, February 10th, 7 PM
O’Brien Civic Center**

**MILTON HAMFEST
ARRL VERMONT STATION CONVENTION
Saturday, February 28th, 8 AM**

RANV

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<http://www.RANV.org>