



SIGNAL



de NINC

July 2007 Volume 16 Number 7

This Month's Meeting

No meeting this month. The NVARC Cookout will be July 28th at 39 Indian Hill Rd which is off Old Ayer Rd in Groton. Talk-in on 146.49.

Last Month's Meeting

Last months meeting presentation was by Jim W1TRC on using the LTSPICE modeling program to analyze circuits.

Attendees at the June meeting: Bob AB1CV, Dale AB1GA, Ken K1JKR, Leo K1LK, Skip K1NKR, Tom K1NNJ, Gary K1YTS, Larry KB1ESR, Ben KB1FJ, Phil KB1JKL, Nancy KB1KEF, Peter KB1LZH, Stan KD1LE, Ralph KD1SM, John KK1X, Don N1HVA, Skip K1NKR, Les N1SV, Jim N8VIM, Peter W1LLB, Dick W1LTN, Jim W1TRC, Bob W1XP, Rod WA1TAC, Earl WR1Y, and guests KB2UIH Jim Fang of Wakefield and WA1CPC Roger Nichols of Pepperell.

Field Day



Larry KB1ESR doing SSTV demo

Field Day participants; Ed W1ZZ, James KB2UIH (GOTA op), Les N1SV and Sarah (GOTA op), John WW1Z, Leo K1LK, Ben KB1FJ, Bob W1XP, Karen KA1JVU, John KK1X and Peg, Warner K1KG, Ralph KD1SM, Jeanine N1QIT, Larry KB1ESR and Cindy, Jim N8VIM, Richard W1LTN, Bob AB1CV, Dale AB1GA and Sarah, Stan KD1LE, Lynda N1PBL, Tom K1NNJ and Linda.

Visitors; Joel W1JMM, Skip K1NKR, WA1TAC Rod, Jim W1TRC.

Complete Field Day coverage next month.

The Longsjo Classic KD1SM

The weekend after Field Day was another beautiful one weather-wise and that was just dandy for the 730 bicycle racers and 14 Ham volunteers who participated in the Longsjo Classic bicycle race.

This four-day event brings professional-level bicyclists from around the world to our area. Day 1 is time trials, day 2 is a circuit race around a 3.1 mile course. The different classes of racers make between 6 and 25 laps of this course. Day 3 is the "Mount Wachusett Road Race". This course in Westminister and Princeton is 11.4 miles and the racers make 4 to 9 laps. On the final lap the racers turn into the Mt. Wachusett Reservation and finish at the top of the mountain. The final day is the Downtown Criterium on a 0.9 mile course with 17 to 55 laps. The Pro Men (the most laps) race a total of 232 miles over the 3 days.

Volunteers from NVARC, the Montachusett Amateur Radio Association, the Mohawk Amateur Radio Club, and the Worcester Emergency Communications Team were stationed around the courses on days 3 and 4 to help with any emergency communication necessary. On the Mountain Road Race our information about the locations of each race group also

helps the Police manage traffic and the USCF officials keep track of the progress of the race.

Operators Bob Johnson AB1CV, Tom Duffy K1JHC, Gary Busler K1YTS, Callie Cornell K1ZAK, Larry Swezey KB1ESR, Ray Lajoie KB1LRL, Stan Pozer-ski KD1LE, Ralph Swick KD1SM, John Griswold KK1X, Charlie Cayen KT1I, Tom Pratt N1KKY, Gordon Lapoint N1MGO, Paul Topolski W1SEX, and Bob Nichols WA1VVT, contributed 214 person-hours of volunteer time to help with health and safety communication as well as course logistics for the US Cycling Federation officials.

In addition to two fine days with excellent vantage points from which to view the races, we get many "thank you"s from the riders and from the USCF officials. The Saturday Ham crew of 12 was specially thanked in-person by two US Cycling Federation officials Kinnin Payson, Longso Technical Director, and Mike Conlan, Chief Referee. Race Director Bill Chiarciaro of the Fitchburg Cycling Club also came over to thank us as we were staging in the Wachusett ski lodge parking lot. Ms. Payson said that the USCF always looks forward to the Longso because of the excellent support they receive from the Amateur Radio operators.

Many thanks to the 14 volunteers who helped this year. KD1SM

The Longso Classic de K1ZAK

The Longso Classic! It's tomorrow! I've been looking forward to this bicycle race for some time. I'll be working with NVARC, my ham radio club, in communications. Well, it looks like I have everything I need for a long day outdoors. I just have to program my HT and I'm all set!

It's an early start for our part in the race; the Ski Lodge at 7:30 with a briefing by Ralph, KD1SM, and Stan, KD1LE, and then off to our stations. The intersection of Rts. 31 and 62, a site I pass on my frequent trips to Princeton, is my station. Parking my car on the sand off the side of the road I think about how to set up. I get out of my car with my HT and map of the route with the placement of the hams who will be assisting. Can I stand here and see what I need to see? I greet the Princeton police officer who will be directing traffic at this station. He walks to one of the islands in the intersection. Aha! I think. That's

the thing to do. So off I go, HT and papers in hand to the other island as the race begins. I listen as KK1X at Hobbs Rd. and N1MGO at Mirick Rd. transmit the passing groups, and I do the same. As some cyclists pass I hear "leaders passing" and I think that if I see a single cyclist or two cyclists they're leaders and so I transmit "leader passing 62". As the race goes on, I realize that's not quite right, and in talking with my officer co-worker I learn how to figure out who are the leaders.

I'm impressed by the cyclists riding by shouting "thank you!" and the pairs of cyclists going by at top speed having a conversation like they're sitting across from each other. How do they do that????

It's getting to the end of the day and I notice stinging on my back and arms (which I later see is a sunburn!) and notice that the plants I've been walking in on the other side of the guardrail have 3 leaves which a few itchy days later I learn is you-know-what! Leaves of three, let them be.

The last group is climbing the mountain and I think my work is done and the marshals will monitor the "stragglers" Wrong! On the way home, after handing in my vest to Stan, KD1LE, at Princeton Center, I'm listening to my HT and hear my fellow hams transmitting messages about which cyclist is where and realize I should be listening to the HT in Princeton and not in Ashburnham!

Stan, KD1LE, and Ralph, KD1SM, are forgiving and I promise myself that next year, given my newfound knowledge, I'll know who's who and what's what and my transmissions will be accurate and reliable and won't leave until the last cyclist is accounted for. And, oh yeah, I'll remember the sunscreen!

Longsjo Classic Bike Race



On the Saturday course the riders climb up into Princeton center on the uphill part of the course headed for King of the Mountain which is the high point at the entrance to the state park. That is where on the last lap the riders turn into the park and climb Mt Wachusett to the finish line on the summit.



Sunday the race moves to downtown Fitchburg on a one mile loop. As the peleton gains speed down Boulder Dr it morphs from the entire width of the road to a narrower line capable of making the turn onto Putnam.



As the peloton moves up Putnam it can get crowded. The wall of hay bales along the right are to keep the riders from hitting various sign posts, hydrants, and in the case of a very bad spill, the building. Some section of the wall gets pushed over most every race. At the top of Putnam the riders turn left on to Main St.

Board Meeting

This month's board meeting discussion topics.

We have updated the Club Brochure and we have a supply on hand. If you know of a location that would be suitable to leave a few see Stan or Ralph. Some ideas are local businesses that have public bulletin boards, restaurants, electronics stores.

Meeting presentations and future meeting presentations for the fall. Some short presentations to add to otherwise short meetings. We are looking for member input to find suitable speakers or subjects.

In attendance Ralph KD1SM, Bob W1XP, Dale AB1GA, John KK1X, Larry KB1ESR, Joel W1JMM, Stan KD1LE and Peter N1ZRG.

Adopt A Highway

June was a busy month with Field Day the 23-24th and the Longsjo Bike Race the next weekend so we had road cleanup early Sunday June 17th. Thanks to the following members for helping out at the cleanup; John KK1X, Calie K1ZAK, Stan KD1LE, Peter N1ZRG, and Bob W1XP.

Next cleanup Sunday July 22nd.

Groton Memorial Day Parade



Above Bob AB1CV Parade Adjutant and NVARC support leader with a fist full of ribbons for groups participating in the parade.

In addition to Bob, Ralph KD1SM, Larry KB1ESR and Stan KD1LE provided public address systems and support at five locations.

ARRL NE Div Cabinet Meeting

Saturday July 8th Ralph KD1SM and Stan KD1LE attended the ARRL New England Directors Cabinet Meeting. The Director holds a meeting one or two weekends before the ARRL Board of Directors Meeting. In attendance are the New England Section Managers, various appointees and Presidents of affiliated clubs. The purpose is the exchange of information about current ARRL activities and to find out what people think needs to be done.

There was a lengthy discussion about the problems on the 70 cm band relating to the PAVE PAWS radars on the Cape and West Coast. The League is actively trying to work the issue.

Report on VE activity since dropping the CW requirement. Basically 9000 general upgrades, 2500 extra upgrades in the last four months. The number of new hams stands unchanged for the past year at about 100 per month.

The total ham population drops by approximately 5000 licenses a year.

There are 20 schools in New England in the Big Project.

Boxboro will continue on the every other year schedule. The next Boxboro is scheduled for 2008.

NEARfest in Deerfield will have a fall event in October and probably in the spring.

More coverage next month.

HR-102

An Introduction to HF Radio
Part IV

Introduction

This month let's look at the subject of HF antennas. Now needless to say that is a pretty big subject. There are many books that have been written on the subject of antennas. Some are better than others. I'll have a few words about recommended books on the subject later, but what I'm going to try and do in the next few paragraphs is give the ham that is new to HF if not ham radio a few words of guidance that are intended to help him (or her) make some intelligent decisions about antenna choices.

One approach

Now one way might be to start with eight 180-foot high towers with a large mono band yagi antenna for each of the bands 80 through 10 meters on them. Three element yagis on 80 and 40 meters and four to six element yagis on the higher bands should do nicely. Then in the back corner you can squeeze in four 128 ft verticals for a "Four Square" antenna for 160 meters. Don't forget to leave room for the one hundred and twenty, 128 ft long wire radials at the base of each vertical. Receiving Beverages can be fit in between the towers as required for the low bands and some VHF antennas can be added to the towers with the smaller loading. Some more wire antennas, including 60 meters, can be hung between the towers for the lower bands. Then when you are done, you can start thinking about some serious antennas.

Approach number two

Well we all like to dream, but few of us can begin to even think in those terms. But you have this new HF radio (or hope to have one soon) and you need an antenna for it. So the new HF ham may ask what antenna should I put up? Well it is a simple question and as usual the answer is not that simple. Before

answering the question one should ask, “well what do you want to do?” And a typical response may be, “just get on the air”. And that is fair and understandable from the ham new to HF operating. But obviously if the ham wants to try 80 meter traffic nets, he doesn’t need and can’t really use a vertical for 10, 15 and 20 meters. Like wise the ham that wants to work phone on the higher bands can’t use the 80 meter dipole. The second part of the problem is what space is available for the antenna. An 80 meter dipole is probably a poor suggestion to the ham with a fifty by fifty foot lot. On the other hand, a multi band trapped vertical is probably not the wisest choice for the lucky ham with two lone 100 ft pine trees 150 feet apart.

The point of all this is that there is no simple answer to the question of what antenna to use. It requires some thought on your part before asking for advice from some one that can help. Now the fellow at the antenna store will be glad to help and many times his advice can be quite useful, but just be aware that he has something to sell. Like wise the ham down the street that just bought the latest and greatest antenna from “DBs by the Buck” may not be the best one to ask about antennas either. In general any one you ask the antenna question to that doesn’t ask what you want to do and where are you going to put it I would not take the response too seriously.

But most importantly, if it hasn’t become obvious yet, the first thing you need to do is ask yourself the same two questions. “Just get on the air” is a perfectly valid response to the first question. But you really need to think through where you might put the antenna. This question may require family discussions or maybe talking to the landlord or neighbors. One ham I know referred to it as the “Fashion Police”. But to have a better go at this part of the antenna question you need to have some candidate antennas in mind to try and see what might fit. Making a simple plan drawing of the yard showing possible antenna supports with dimensions can make this task easier and is probably worth the effort if space is limited.

Antennas

So far I haven’t said much about antennas at all. Well until you understand some of the issues trying to discuss antennas is out of order. But let’s go over the several basic antennas that you might choose from. In no way is this intended to be an in depth survey of antennas but just to review some of the basic antenna types and what might be their advantages and disadvantages.

The Dipole Antenna

This is probably the most basic antenna and it can be very effective. In the same location some of the biggest antennas for the same band will hardly be an S unit better in terms of radiated signal (The pattern of a large beam antenna may improve the signal to noise ratio on receive by rejecting interference.) A dipole in the clear and at least two tenths of a wavelength above ground is a good antenna. Higher is always better but this is roughly 50 feet at 80 meters and 25 at 40 meters. Some will tell you that a dipole this low is a “cloud warmer” because the main radiation is straight up. And this is correct. It is because of the high angle radiation that it is a very good antenna for coverage on 80 and 40 meters out to 500 miles. And just because the antenna doesn’t know any better you can occasionally work some real DX on such antennas. Some times Mother Nature just smiles on us. In this vein, a dipole antennas a half wavelength or higher in the air is very good DX antennas. At a half wave (only 33 ft on 20 meters) the dipole has a good low angle lobe broad side to the antenna wire. High dipoles, in wavelengths, can be very effective DX antennas.

There are many antennas I am going to group into the dipole category to keep this short. One such antenna is the inverted V antenna. This antenna is a dipole with the center raised up high in the air and the ends brought down to near ground. This antenna, although not quit as good as the horizontal dipole, is still very effective. It has the advantage of only requiring one high support. I will also put the G5RV antenna into this category. It is a multi band antenna but is basically a dipole antenna. It is also about 25 to 30 feet shorter than the 80 meter dipole and fed with a section of 450-ohm transmission line and then a length of coax to the shack. The Windom is also in this category. It is a dipole but is fed off center. It also has multi band properties. This antenna can be used to advantage in locations where the feed line can be handled better if it is off the center. There are two other examples. One is the half wave dipole center fed with high impedance, low loss line such as 450-ohm ladder line, and the other is the same half wave antenna end feed with the same feed line. This antenna is sometimes called the End Fed Zepp. I’ll have more later when we talk about multi band antennas. But basically these antennas all share the same common properties of the dipole.

The Vertical Antenna

The vertical is very popular and probably the most misunderstood antenna. It comes in many varieties like the dipole antenna. It can be ground mounted which can be a real advantage. It is also Omni directional which can be an advantage also. This antenna also comes in multi band versions. In fact in a survey the ARRL did a few years ago of HF antenna

types the multi band vertical was the most popular antenna at 25 percent. "All these people can't be wrong, so why don't I want one?" you ask. Well maybe you do. But you should understand what a vertical antenna has to offer. You should understand the advantages and disadvantages so you can make an intelligent choice. I have already mentioned the ground mounting and Omnidirectional pattern. Both can be good things. But the pattern can be the biggest advantage or disadvantage. The vertical has a low angle of radiation and this can be a real plus on the higher bands. For example on 20 15 and 10 meters the low angle of radiation makes the antenna very effective for DX contacts. There is really no high angle short skip on these bands like on the lower bands. So the antenna is very effective. It puts the radiation where it can do the most good. But to use a vertical on the lower bands and especially to try and work the high angle local coverage that these bands offer with a vertical antenna is a poor show. The vertical has a null in the radiation off the top end so it puts very little energy where you need it for the local coverage on these bands out to 500 miles or so. On the other hand at longer range where the low angle of radiation is an advantage the vertical is effective.

I'll try and make it clearer. Referring back to the propagation discussion in HR 102 part II, it was pointed out that local communications (out to 300 or more miles) was possible during daylight on 40 meter, and on 80 and 160 meters nearly full time, via near normal reflection from the E layer. This is a very effective and useful mode of propagation. But to be most effective the antennas in use need to radiate at a high angle. The low dipole (a quarter wave length high or less) provides this radiation pattern. On the other hand a vertical antenna, by the very geometry does not radiate well in this direction. The vertical is great for working DX. The low dipole is great for working the locals. That doesn't mean the dipole will not work DX. There is some radiation from the vertical that gets up to where it is needed for the local contacts. But for reliable results you will do better to stick with the preferred antenna for either mode if possible. See conclusions for more comments on antenna choices.

I'm not sure which is the chicken or the egg here, but because of the popularity of the multi band vertical, there are many variations on the market. There is a version, or more, by almost all the antenna manufacturers. Most are multi band antennas that use traps or multi elements in parallel to establish resonance at multiple frequencies. Most of these antennas are resonant as quarter wave elements, although there is one antenna that is half wave resonant. It uses a small cluster of four-foot whips to decouple the feed line and a matching transformer to

end feed the half wave resonant element. This element has multiple traps for the various bands. This antenna is actually quite effective and one version covers seven bands. It is a nice portable antenna for use on the higher bands. Because of the angle of radiation problem mentioned above it should not be considered a good emergency communications antenna.

The Multi Band Antenna

This type of antenna can be either a dipole or a vertical. In general they work on one or more of three principles. The first uses the natural multi resonant nature of a conductor and the harmonic relationship of the amateur bands. The second principle uses resonant circuits (traps) to decouple parts of the antenna for operation on multiple frequencies. The third principle is to connect multi elements in parallel at the feed point. This allows the antenna currents to flow in the desired element by nature of the off resonance high impedance of the non-resonant elements. An example is the multi wire dipole.

The first type of multi band dipole uses the fundamental and odd multiples of the fundamental frequency. At odd harmonic frequencies (1,3, 5 etc) the center impedance is low. So the SWR to a low impedance feed line is reasonable. For example a 40-meter dipole used on 15 meters (7 and 21 MHz) and an 80-meter dipole used on 30 meters (3.5 and 10.1 MHz) are examples of dipoles used in this fashion. There are simple changes to the wires in the dipoles that allow the harmonic resonance to be moved around a bit to improve the match at the harmonic frequencies.

The even harmonic performance of the antenna can be used by connecting high impedance, low loss feed line to the center of the dipole. It is necessary to use a wide range balanced antenna coupling device (antenna coupler) at the shack end of the feed line to match into the 50-ohm transceiver. But with such a tuner and antenna arrangement it is possible to use the antenna on all bands. The down side is you need to tune the antenna system via the antenna coupler when changing bands. But a coupler with calibration on the controls and a tuning look up table can easily make band changing quicker. More costly automatic tuners are now on the market that can do the job in seconds. The beauty of this type of antenna, and I will include the End Fed Zepp with it, is that it can work on just about all the bands. This arrangement isn't too effective below the frequency band that the dipole element is half wave resonant. For example a 66 ft long (half wave on 40 meters) antenna will not work well on 160 or 80 meters, but will work well on all bands 40 meters and above. This type of antenna especially if you can use an 80-

meter (135 foot long) half wave dipole element is a lot of "bang for the buck".

The G5RV antenna, which uses a 102-foot long dipole section and a section of 450-ohm ladder line and then a coax section to the shack, still needs a coupler for all band operation. The G5RV is also a very effective antenna. There is also the off center fed Windom antenna. They are in the same category as the G5RV.

Traps have never been popular with wire antenna builder. There are designs available for all of the bands. One reason I believe traps are not favored is they tend to be heavy and cause a lot of physical strain in the antenna. Another is likely that the multi wire antenna is lighter and works as well if not better. But trap designs for beam antennas and verticals are very common. Here the physical support of the trap is not as big an issue. Traps do have some loss but in general the multi band feature is out weighted by the small losses in the traps.

As mentioned earlier, multi band antennas can be made by paralleling elements. This technique is used in both dipole and vertical antennas. In the dipole example the quarter wave elements for higher bands are hung beneath the lower band wires. Usually spacers are used to keep the wires from tangling. It is just like building several separate dipoles and mounting them close together and connecting them to a common feed line. Such antennas work well and I recommend them as one way to get several bands of performance out of a single antenna installation. I have seen problems obtaining a good impedance match (low SWR) when trying this with antennas for the newer WARC bands that are not harmonically related like the older bands.

The multi band antenna is always a bit of a compromise compared to a dedicated antenna for a band. But just putting up half wave dipoles for all the bands 80 to 10 meters is a lot of work. It will also require a lot of space. So the multi band antenna is a very good choice.

Directional Antennas

The subject of directional antennas, or beams, is beyond the scope of this article, but one I may visit in the future.

Antenna Quality

Now some of these next comments apply just as well to dipole antennas as to verticals. Anytime an antenna is small in terms of the wavelength it is working at it is going to be inefficient. It is one of Mother Nature's rules. The designer has some control over the losses but there are practical limits to what he can achieve. So the small antenna will

probably not work as well as a larger one for the same frequency. Some of the "DBs by the Buck" guys will try and tell you that they have a secret that makes their antenna work better than its full sized brother, but they probably haven't. When you are buying an antenna (I suggest building it if you can) you should pay more attention to the quality of the product. What materials is it made out of? Is it resistant to sunlight? Will the hardware rust before you get it in the air? Are the assembly instructions clear and accurate? Because no manufacturer has anything on Mother Nature, they all have to play by the same rules of physics as to how the antenna works. But they can build a bad antenna. Especially with gain antennas like yagis, attention to detail can make a big difference in the radiation pattern for example. But for the more simple antennas like dipoles and verticals the materials and quality in the final product is probably more important than some number that is half a dB better than some other manufactures numbers.

But as I said above I suggest you consider building an antenna. Especially antennas like dipoles and simple verticals. Wire antennas are easy to make. All you need are simple hand tools and a tape measure. If you don't feel totally at ease with the project, then ask another ham to give you a hand. With the warm weather here (well maybe hot) it is a good time to get out the antenna books and plan an antenna project.

Reference Books

As I mentioned above there are many books on antennas. The ARRL Antenna Book is now in its 21st edition. I counted no fewer than 31 books on antennas and transmission lines in the latest ARRL publications flyer. So there is plenty of material available. The one book that I think is a good beginners book on antennas is "Simple and Fun Antennas for Hams" By Chuck Hutchinson, K8CH and Dean Straw, N6BV. This book has more than just HF antennas in it. There are also VHF antennas in the book. But it covers elementary antenna theory and is clear and easy to understand. There are many antenna projects but most are simple enough to be completed in a weekend if not just a few hours. Many of the antenna projects are taken from previous QST articles so they have had the test of time.

Conclusions

First of all, I've always said, "anything will radiate". Simply put that means, there are lots of antennas, and some are much better than others. I've tried to show that the choice of a suitable antenna can be complicated by what you would like it to do and where you can put it. And there is no antenna that does EVERYTHING! The choice is almost always a

compromise. But I want to make the point, that just because you can't put up the antenna that might be the best choice, at least put up what you can! Any antenna in the air works better than no antenna at all.

Antennas are a complex subject. But understanding the basic types and their features and disadvantages can allow the user to make an intelligent choice. **Don't be afraid to ask for help.** And at the same time I suggest you search out some references on the subject. Antennas are one area in amateur radio where a little knowledge can be a very powerful tool in helping you to assemble an effective station that does what you want it to do. Till next time, 73 Bob W1XP

Treasurers Report

Income for June was \$75 from member dues, \$2 from ARRL renewals, and \$54.91 from bank interest. Expenses were \$16.40 for newsletter postage and \$100 for (part of) Field Day leaving a net income of \$15.51 for the month.

Current balances:

General fund	\$4,731.99
Community fund	\$2,136.83

As of 12 July we have 60 members who are current with their dues and 5 renewals outstanding. Please check the member roster that is circulated at the monthly meeting if you do not remember your renewal date. Your membership date also appears on your newsletter mailing label.

If you have not been receiving the monthly notices when the Signal is posted in the Web then we do not have your current email address. These notices are usually sent the weekend after the Board meeting.

If you are not yet an ARRL member then you're missing a lot. Please consider joining. If you let me send in your membership then the Club receives a portion of your ARRL dues.

Ralph KD1SM

PSLIST

Aug
18 Mt WashngtnNH Mt. Wash. Bicycle Hill Climb
Cliff N1RCQ n1rcq@amsat.org or Dave KA1VJU
ka1vju@cnharc.org

19 Mt WashngtnNH Mt. Washington Century Ride
Cliff N1RCQ n1rcq@amsat.org or Dave KA1VJU
ka1vju@cnharc.org

Sep
29 Bristol NH NH Marathon Cliff N1RCQ
n1rcq@amsat.org or Dave KA1VJU
ka1vju@cnharc.org

Oct
6 Hollis NH Applefest Half Marathon Jim WD4JZO
wd4jzo@arrl.net

NVARC Club Net

The club net meets on the 442.900 repeater. Subjects discussed recently; upcoming events Groton Road Race wrap up, upcoming Parker Road Race, road cleanup.

Recent participants include Dave N1MNX, Bob W1XP, Bob AB1CV, Joel W1JMM, Larry KB1ESR, Skip K1NKR, Gary K1YTS, Ralph KD1SM, Stan KD1LE, Les N1SV, Richard KB1MBR, Ken K1JKR, Den KD2S.

The net is a good place to bring information for the club and questions or discussions. The net meets at 8:00 PM Monday evenings on the 442.900 N1MNX repeater.

Flea Markets

August
19 MIT
19 Adams MA

September
15 Forestdale RI
16 Western CT Hamfest Newtown CT
16 MIT

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Tell them you saw it in the Signal. Advertisers should contact the NVARC Treasurer for information.

Contest, DXpeditions and Special Events

The information for a DXpedition can be quite detailed and may include bands, dates, number of stations, and times of day they plan to work certain continents so I can not list it all here. But if a country or prefix is of interest you can get more information at www.425dxn.org.

Contests 2007

August
ARRL UHF Contest

September
8-10 ARRL September VHF QSO Party
CQWW RTTY DX 4th full weekend

November
ARRL November Sweepstakes CW
17-19 November Sweepstakes Phone
30-Dec 2 ARRL 160 Meter Contest

DXpeditions

Call	Location	Until
TU2/F5LDY	Ivory Coast	31 August 07
9V1CW	Singapore	2008
8Q7IM	Maldives	Nov 2007

See www.425dxn.org for more listings



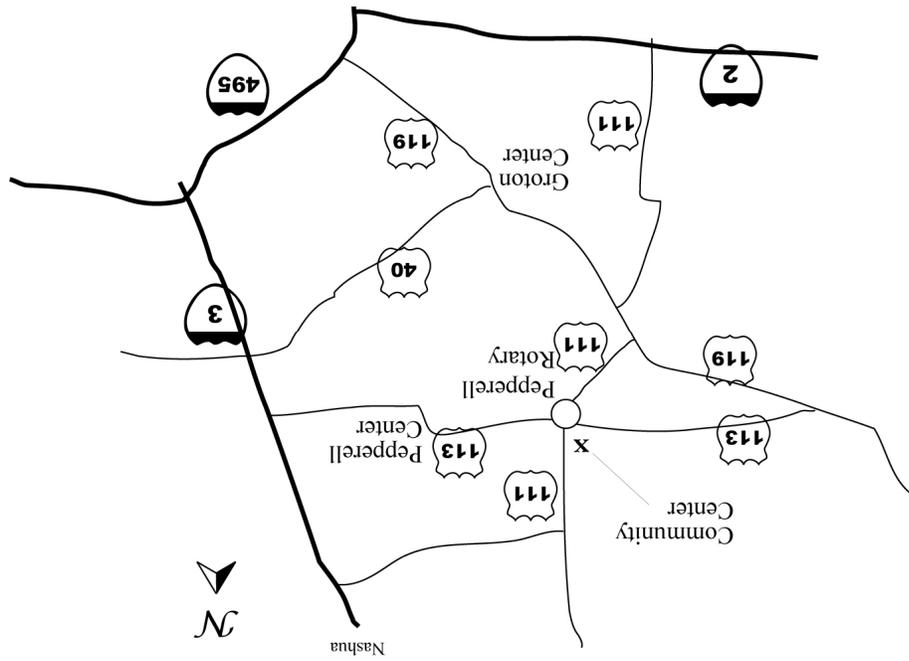
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<http://www.n1nc.org/>

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Joel Magid W1JMM 2006-2009
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Meetings are held on the 3rd Thursday of the month
7:30 p.m. - Pepperell Community Ctr.
Talk-in 146.490 simplex
442.900 + 100Hz Repeater
147.345 + 100 Hz Repeater
53.890 - 100Hz Repeater
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