

de N1NC

October 2000 Volume 9 Number 8

### This Month's Meeting

This month's meeting will be a presentation on Radio Direction Finding and Fox Hunting By Ralph KD1SM and Stan KD1LE. They recently presented this program at the Boxboro Convention to rave reviews.

Bring your short Show-and-Tells to the meetings. They are always welcome. We want to know what things people are working on.

We gather at Tiny's for breakfast Saturday mornings at 8:00 AM. We sit in the back dining area.

Les Peters N1SV, Dave Peabody N1MNX, Ben Akins, KB1FJ, Larry Swezey KB1ESR, Dan Daigneault N1LLG, Herm Raymond WW1HR (new call), Pat Rice N1VAW, Jane from Arizona (Pat's guest), Stew Jackson K1YET, Ralph Swick KD1SM.

Remember the cleanup is always scheduled for the Sunday morning after the monthly meeting. We meet at the Groton school parking lot at 9:00 AM. The cleanup takes about one hour and with eight people the division of the road is easy. Come out and join us for a leisurely Sunday morning stroll.

Stan KD1LE

### Technician Class

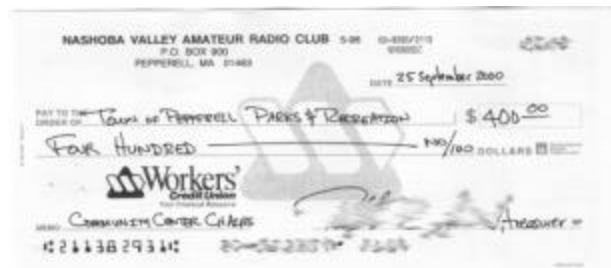
There is a Technician Class license class running at Monty Tech which started Thursday September 28th. Most classes are Thursday nights though a few are scheduled for Saturdays. The contact is Paul Topolski W1SEX (ptopolski@net1plus.com). Paul is seeking instructors for one night stints teaching the class. If you want information on the schedule contact Ralph or Stan.

### Last Month's Meeting

We voted on and approved a proposal that had been brought to the board to donate \$400 to the Pepperell Parks and Recreation Commission for the purchase of stacking chairs for the Community Center. This was in appreciation of the use we have had of the facility for the past six years. A few years ago we had discussed donating toward the tables they purchased but they bought all they needed before we acted. Recently we had become aware that they intended to replace the metal folding chairs with padded stacking chairs. The proposal was approved unanimously by the members.

### Road Cleanup

There was a good turn out for the September road cleanup. Ten members and one guest helped out. Since we had missed the July and August cleanups due to weather and scheduling problems there was a bit more to pick up this time. We have just two more cleanups for the year. Where did the year 2000 go??? Thanks to Ralph for volunteering to run this one while I was off volunteering at the Jimmy Fund Marathon Walk for the day. Thanks to the following people for their help. Bob Reif W1XP,



In addition a proposal was made to help defray the costs that members incur when putting together a presentation to be given at NVARC and other local radio clubs. The complete proposal was in last month's newsletter. It was agreed to go ahead with the proposal and to review it at a later unspecified time.

Erik brought up the subject of the open Vice President and Board positions and asked for volunteers. Den KD2S volunteered for the Board spot and was unanimously voted in by the members present.

We had several visitors at the September meeting. They were Dennis Marandos K1LGQ, Diane K1LQ friend of Dennis, Jim N8VIM (new neighbor of Den KD2S), Don Purcell KC2AON who joined at the meeting. Welcome to all.

The presentation was Simple Low Frequency Antennas by Bob Reif W1XP. Bob talked about the requirements for long distance communications (DX) on the low bands and then talked about the advantages of vertical antennas vs horizontal antennas and the heights that were required for each type of antenna. He also covered some of the disadvantages of verticals and the ways to compensate for them. Bob showed many gain plots for the various antennas. He then showed a simple antenna he designed with the dimensions needed for various frequencies and configurations. Many questions were asked and there was discussion about various options to the layouts. He discussed typical measurements that would accommodate the various limitations of available limitations of height of the support structure and area for radials. Bob wrapped up with some future design thoughts and antennas he was going to try.

**Board of Directors Meeting**

We are working on the programs for future months and would like suggestions of topics or particular presentations that we might try to do.

As an added attraction to meetings we have decided to start a monthly raffle with the prize being an ARRL book. This will commence at the November meeting. Tickets for the raffle will be \$1.

**Pepperell Fall Soccer Tournament**

Over the three-day Columbus Day weekend, sixteen NVARC members volunteered a total of 118 person hours in support of health and safety communications for the Pepperell Fall Classic soccer tournament. Participating NVARC members and their individual volunteer hours were:



Larry KB1ESR (4.5), Ben KB1FJ (9.5), Stan KD1LE (14), Ralph KD1SM (21.5), Jonathan N1JGA (2.5), Dave N1MNX (5), Lynda N1PBL (6.5), Jeanine N1QIT (4), Linda N1UPR (7.5), Greg N1VAV (4.5), Pat N1VAW (4.5), Ian NZ1B (19.5),

Bob W1XP (2), Rod WA1TAC (4), Earl WR1Y (3), Herm WW1HR (5)



In addition, Ian NZ1B spent uncounted hours coordinating with the tournament committee in the weeks prior to the event and soliciting volunteers for the weekend.



The Pepperell Soccer Tournament staff and the Pepperell Ambulance service thank all those who volunteered their time to help keep the tournament safe this year. With 242 teams of 10 to 12 players each, there were lots of chances for accidents. For-

tunately there were no serious injuries this year. Everyone who helps with this event knows that the parents and coaches appreciate our being there. And we have the enjoyment of watching lots of young folk play enthusiastic soccer and lots of other young folk help them do so by refereeing and marshaling.

-Ralph KD1SM



### Presentation Preparation Help

If you would like assistance preparing a presentation, several members have volunteered to help. They can review a draft presentation and/or help produce the presentation materials. See Stan, Erik or Ralph if you are interested in some assistance.

### Fox Hunting

The NVARC foxbox has returned to the area woodlands after a summer hiatus. The busy schedules of the fox masters kept it from being out in the field for most of the summer. But the past month has been less hectic so we're going again. If you thought the fox was always in some far away loca-

tion such that you wouldn't hear it your wrong. Here are the approximate locations where it hid just waiting to be found. The weekend of September 9-10 it was within a mile of the center of Groton sitting patiently on secluded hillside in a hardwood forest. The weekend of September 16-17 it was also within a mile of the center of Groton. The weekend of September 23-24 it was within a mile of the convergence of the Townsend, Pepperell, and Groton borders. The weekend of September 30 Oct 1 it was located about a mile from Shirley Depot. So in your travels you might want to have 145.630 in the list of scan frequencies on your rig. Although I listed these by weekend the foxbox usually goes out before 8 AM on Saturday morning and normally runs till Tuesday or Wednesday evening. With the days getting shorter that may change to a Sunday night pickup.

Over the past few weeks the following searchers signed in at the fox; Ralph KD1SM, Barry W1HFN, Karen KA1JVU, Bob W1XP, Mike WZ0C from Cambridge, Herm WW1HR and Larry KB1ESR.

If you want more that one hunt a week there is always the MMRA hunts on Saturday mornings at 10:00 AM. They are generally run on the input of the Marlboro repeater. The format is to start whenever you want and the first transmission is at 10 AM. On requirement is that the fox must have a reasonable signal into the repeater. The distance this translates into is of course related to the amount of power being used. They also use a twenty mile radius from the repeater for a limit. The transmissions will be at least every five minutes. Some of the hunters share information using either the repeater or 442.00 MHz simplex. You can choose to share or not. Along the way the fox may ask who is hunting. This is to know when everyone has found the fox. The intention is that everyone will find the fox by noon so the fox may ask if there is still anyone hunting and do you need more frequent transmissions or hints. Around noon they head to some local eatery to share tales. The MMRA also runs a foxbox which is sometimes up this way though more often in the Hudson/Marlboro area. It just depends on who is hiding it. It is out for the weekend like ours and maybe a few days on either side depending on the person putting it out.

## Field Day Fullerton CA

It was pointed out by an observant reader that the pictures that were mentioned in this article last month were not to be found in the newsletter. So here they are.



Above is the front porch of the log cabin where they operate. The six meter and HF vertical are in the foreground.



ready if we needed it. This year's \$29 screenhouse went up but we hoped for no rain since it wasn't quite waterproof, but it was good enough to keep out the bugs. we'll add a tarp for next year.

Friday morning comes way too early but somehow we make it to breakfast. Jim met Steve and Jean at breakfast. Jean talked about her driving school this year and said "I proved nobody can hear you scream in your helmet". It's usually her birthday weekend so happy birthday Jean - again!

Jim and Rob end up at 3 to do ATV, Mark and Niece at 17, Bruce-LUS at 13, Bruce-CIC at 14, Dave at 6 and Mike at 16. Chris and Peter couldn't ride up Thursday so they missed the fun.



First car up is Sprongl, and when he went by 17, Niece turned to Mark and said "(a bad word) Field Day!" She's hooked. Jim had his camera but the camcorder was left in Mark's truck so no video got captured. At least the camera gave control the pictures going uphill. Car 176 came in and ended up sideways at the apex, but got it going again. One car (who we won't mention) came over the rise just after 2 and Rob said "now that's a strange line". He came into 3 very wrong and had to back out of it. Just like computers - garbage in, garbage out.

The driving was decent with cars pulling over in a safe place if they couldn't continue which meant a yellow to warn other drivers that they can get by. We knew it wouldn't set the stage for the other two days. Mark was happy to see three Porsche's running event this year since he now scares himself with his Porsche at the race tracks.

## Other Field Day Activities Mt. Washington NH. 2000

### The Ham Gang

This year's ham gang in Jim's group is the largest yet. We had Mark AB1X, Rob N1ICB, Dave W1TQ, Chris KB1EJR, Peter N1ACT, Niece KA1ULN, Mike Boucher, Bruce W1LUS, Bruce KB1CIC, Erik KA1RV and Jim N1HTS. Mary Beth N1FER had to back out at the last minute but said to plan on her next year.

On Thursday we had a nice ride up. Erik was not with us so no reason to stop at HRO. When we got there we stopped at the base to put up the ATV receiving gear. Ian AF1R showed up before we left so we helped with his setup too. This year we brought two antennas for the campsite. The usual ladderline dipole and an R7 vertical. The R7 ended up being the only one we used but the other was

The car show wasn't in Gorham this year but in Lancaster about 25 miles away. Not only was it a small show, but everything closes down early. Restaurants are closed by 8:30. We found one "restaurant" which didn't have beer, Not what this crowd wanted to hear. By the time we got back to the campground Erik had arrived. He came straight from work in Cambridge. Congratulations go out to Elizabeth Campbell and Karen Houghton who got married at 7:30PM on the deck of the summit building.

Saturday morning rolls around and it's not getting easier. Jim and Mark are at 24 with the ATV, Mike at 16, Niece at 9, Bruce-LUS at 26, Bruce-CIC at 6, Rob at 2, Peter and Chris at 21, Dave at finish and Erik at 10.

Weather is great! We can see the buildings at the top from the base. We get to our stations and it's t-shirt weather above tree line. We can deal with this. Jim and Mark set up the ATV gear. One camera on Jim's 439Mhz gear and one on Ian's 900Mhz gear. This way control can see the cars coming into 24 and leaving 24. Dave Patten in car 21 comes by 24 and Mark says "boy is he smooth". Dave round the corner at 25 and we hear problems. He's stuck in 2nd gear and eventually stops at 27. Good going Mark!

Since the first run was pretty quiet, Jim switches cameras around and faces the camcorder downhill. Towards the end of the session he gets Bert Cox's car 17 getting launched off a rock. Jim grabs the firebottle and starts running downhill through the rocks and brush while Mark calls in the emergency. Bert did side-to-side rolls then nose-to-tails, then every which way until the car stopped before he got to the second ledge. Jim is half way down between the first and second ledge and Bert starts to climb out. WHEW! Jim has him sit down until he gets to him and then discusses how he is. Bert's says he's ok and Jim asked "so, was it a code brown?" Bert didn't understand so Jim said "check your shorts?" Bert said with a big smile "OH YEAH!" By now Mark has arrived and the other response folk have made it to the first ledge. Jim and Bert head to the car to check out the smoke coming from the engine compartment. The hood was so smashed that it took a few minutes to open the hood. The smoke was just from fluids on the hot engine and the smoke stopped shortly. Bert is escorted to the road with the ambulance personnel. Mark estimates to control the car is down about 300 feet. Jim went up to get the camcorder to shoot some video to help Howie in control determine what he'll need to get it out. We were close. The MANLY wrecker used 380' of cable. Mark found a Moody Blue's CD that came out of the car. We were wondering which song Bert was listening to. Mark commented that there are easier ways to eject a CD! What a way to end a session. If Bert was to burn a CD, he may want to include the following: Isn't Life Strange?, Your Wildest Dreams, Ride My See-saw, Voices In The Sky, Sooner Or Later (walking on air), Strange Times and The Voyage. Jim gets to show the tape to LOTS of people at the bottom, including Bert. He also showed it at the party at the end of the day on the bigger screen. At the end the wreckers showed up at the bottom and it cleared the tent while people raced to the fence

to look at the car. Food and beer was good but we missed Drew and company giving out worker give-away. After qualifying we did our walk through the paddock area and most notable quote from a driver was Sherm Baumann as he was hunched over his engine. "It's not good when you see internal parts from the outside" Chris McNamara is the new organizer of the event. It'll be a while before he can talk as long as Gibby. Mark gets his 10 year recognition and Rob gets his 5 year. Since this is Chris' first year doing this we name him the weather steward. Back at the campground Field Day points are given out by Mark, Dave, Bruce-LUS and Niece.

Sunday starts with Erik pulling "an Erik". Bruce-LUS is happy to have "passed the baton" back to him. Erik finally shows up just before the worker meeting. He's alive! On the way to the mountain, Mark spots his first moose by the road. We were wondering why Niece and Mike were stopping ahead of us. As we were leaving others were stopping however WAY too close to the moose for our comfort. Jim and Mark is back at 24, Dave is at 30, Rob is at 19, Erik is at 25, Bruce-LUS is at 2, Bruce-CIC is at 17, Peter is at 10, Chris is at 11, Niece is at 9 and Mike is at 16 for the third straight day. Buffum sends the vintage cars up first to see how bad the visibility was at the top. When they couldn't find the parking lot in the fog, the finish had to be moved further down, which ended up at 30, so Dave got to work again. Ray Blethen in car 50 crashed big time at 18 bringing out the red flag again. After the medical folk took care of him, he sent word to his sons who was already at the finish that he was ok and to prepare for the second run. What's a couple of broken ribs and a trashed car? There were way too many flags and it really slowed down the first run. By the time we got ready for the next run it was about 3:30 and bad weather was close so the organizers had to call an end to the event. Jim had started tearing down his ATV gear when the first of the rain drops came. We had enough time to get to the bottom, and tear down the ATV receiving gear when it started to pour. Since some had to take down their tents to get ready to leave, we left Ian with the task of taking down his antenna's. Sorry Ian. This year's overall winner is Frank Sprongl with a winning time of 5:07:92 for the 6 miles.

Monday morning comes and Jim and Rob pack up and head home in a very leisurely fashion, not like Erik who slept over but left thecampground at 5AM

to drive straight to Cambridge to go to work. As Jim and Rob hit the Lowell area a MAJOR thunderstorm was coming through. Glad we didn't get this stuff in the great white north. Naturally we're all signed up for next year.

For those who want to see pictures of the event, check out <http://www.eggo.org> and follow the link to the Mt Washington pictures. We have a video clip (no audio) of the car going off but the file is large. You've been warned.

For info on the hillclimb:  
<http://www.climbtothecLOUDS.com>

### Then there's FRS for the rest

Written by David K. Peabody October 13,2000

As some of you may know there is a popular new two-way radio band called FRS. FRS means Family Radio Service. FRS was originally set up by the FCC (Federal Communications Commission) to accommodate Families or non-profit groups with non-licensed, low power, short distance communications. The FCC set aside 14 channels to be used for this purpose. Frequencies allocated are in the 462 & 467 Megahertz area, referred to as the "UHF" band. The use of low power of 500milliwatts (1/2 a watt) maximum is required so as to not interfere with other services.

To assist in the multiple user aspect and to give a little more privacy manufactures added 38 sub-audible tones sometimes referred to as PL (Private Line tones) the abbreviation coined by Motorola. The PL tone idea is known officially as CTCSS (Continuous Tone Coded Squelch System). This gives you 532 possible combinations of frequency and tone. "532 combinations" is the marketing version. Of course, we Hams know that 14 frequencies are limited to 14 simultaneous conversations maximum. FRS users are supposed to look at the radio display before transmitting to make sure the frequency is clear. Some manufacturers went as far as to include an encryption scheme to give added privacy. The operating frequencies are nestled in with the "GMRS" (General Mobile Radio Service) which is licensed, and higher power, for greater area coverage of mobile applications.

To be type accepted in FRS, radios must have non-detachable antennas. This restriction also helps increase the shareability of the 14 frequencies by further controlling the effective radiated power of the transmitter. One user cannot monopolize an FRS channel by replacing the "rubber resistor" ducky antenna with a gain antenna. Most manufacturers, and a general consensus in the industry, indicate that the average useful range should be around 2 miles. Of course that has to take into account terrain and obstacles. An example is on a desert or open body of water the range may be increased. But in the inner city or areas with lots of obstacles that may be decreased.

A purchaser of these "FRS" radios must carefully read the literature accompanying the product to be aware that the radios contain these features, as I will explain. The tones and encryption are valuable features because as the market gets flooded with these, and use increases you will have more versatility (532) possibilities, plus encryption to get a little more privacy. Not having to listen to other conversations, and knowing that if you hear something, it may pertain to your family or group this is a big reason to want these features.

An important consideration is to purchase a style that it is compatible with the ones you already own. That way you will be able to stock common batteries, PL tones or encryption will be compatible and maybe even choice of one color for ease of identification. Purchase of different models does not mean that yours will not be able to communicate with others on the common channels, just that you may not have the use of privacy features. Units are available with anywhere from 1 to 14 channels. While the PL tones themselves will be compatible, the way the tones are identified in the display and the buttons you must press to set them may differ. Never underestimate the benefit of knowing how to tell someone over the air what buttons to push and what to look for on the display!

Typical uses for this form of communications may be hunting, fishing, hiking, parades, neighbor to neighbor or house to tree house, snowmobile, sporting events, and many other uses. Important: You are not the only one using these radios, everyone has the right to use these frequencies, courtesy is very important. DO UNTO OTHERS... Emergencies as with all communications take priority!

## FRS Channel Number vs. Frequency in MHz

1=462.5625	2=462.5875	3=462.612
4=462.6375	5=462.6625	6=462.6875
7=462.7125	8=467.5625	9=467.5875
10=467.6125	11=467.6375	12=467.6625
13=467.6875	14=467.7125	

There are at least two proposals for "calling channels" in FRS. REACT is suggesting that channel 1 with NO TONE be used as a calling channel. Another proposal has suggested channel 1 as a general calling channel and channel 9 as an emergency channel. One problem with this second proposal is that older FRS radios may have fewer than 9 channels. The good thing about this is that when hiking, or other activities for instance, National, and State Park Rangers can monitor it for your safety.

Channel 1 is also common with the output of a GMRS Repeater frequency. It is also legal for a licensed GMRS operator to communicate with an FRS user. Each having to follow the rules of that service. ie. FRS 1/2 watt no external antenna etc. The GMRS would use repeater output (simplex) only. As always using the least amount of power to establish communications.

Care should be taken when seeing ads for FRS+ or (plus) these are GMRS not FRS radios.

This is a poor marketing strategy which leads the consumer to believe that operation by unlicensed persons is O.K. if you read the fine print somewhere in that ad it will tell you "license is required." LET THE BUYER BEWARE!

The REACT proposal is available at <http://www.reactintl.org/pr20000616a.htm>. Eventually if consensus develops around one of these calling channel proposals, we may see manufacturers add an 'emergency channel' button and monitor or priority scan feature to these simple radios.

I hope this information gives you a little insight and may help you with your decision. If greater distance is a necessity, other communications services may be more practical such as GMRS (license required), Commercial two-way radio (license required), Ham Radio (license required), or simply a CELL Phone (no license required). License information may be obtained at <http://www.fcc.org>

## The Public Service List (October)

Public Service Volunteer Opportunities in the New England Division Listing public events at which Amateur Radio communications is providing a public service and for which additional volunteers from the Amateur Community are needed and welcome. Please contact the person listed to identify how you may serve and what equipment you may need to bring.

Date Location Event Contact Tel/Email

Oct 20-22 Boston MA Head of the Charles Regatta Jeff N1FWV 978-536-2842 RWJeffA@aol.com

Oct 22 Lowell MA Lowell Marathon Stan KD1LE 978-433-5090 kd1le@amsat.org

Oct 22 Duxbury MA Black Cat Classic Road Race John N2YHK 508-752-2433 n2yhk@wpi.edu

This list is published periodically as demand warrants by Stan KD1LE and Ralph KD1SM. Our usual distribution is via packet to NEBBS, via Internet mail to the arrl-nediv-list and ema-arrl distribution lists, and on the World Wide Web (see URL below). If other mailing list owners wish us to distribute via their lists we will be happy to oblige. Permission is herewith granted to republish this list in its entirety provided credit is given to the authors and the URL below is included. Send comments, corrections, and updates to: (via packet) [KD1SM@K1UGM.#EMA.MA.USA](mailto:KD1SM@K1UGM.#EMA.MA.USA), (via Internet) [KD1SM@ARRL.NET](mailto:KD1SM@ARRL.NET). We make an attempt to confirm entries with the coordinator unless the information is from another published source. We very much appreciate the assistance we have been receiving from our 'scouts'; everyone is welcome to send us postings. World Wide Web users: the most recent copy of this list is maintained as

<http://purl.org/hamradio/publicservice/nediv>.

## \$October Treasurer Report\$

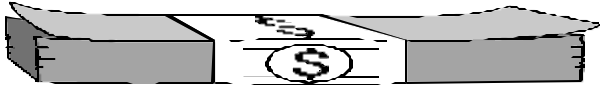
Since the September report we collected \$135 in dues. The harp-eyed road cleanup crew found \$5.05. Expenses were \$19.80 for newsletter postage, leaving a net income of \$120.25.



As agreed at the September meeting, we donated \$400 from the Community Fund to the Town of Pepperell Parks and Recreation Department for the purchase of new chairs for the Community Center.

Fund balances as of October 14 are:

General fund \$977.61  
Community fund \$1192.55



Remember, when you are renewing your ARRL membership let me send it in for you. You will save a stamp and the ARRL lets us keep part of your dues to add to the treasury. If you do this, make your check out to NVARC.

73,-Ralph KD1SM

### 2000-2001 Fleamarkets

21 Oct Nashua NH NE Antique RC \$5@8 \$1@9 @ Res Ctr Church 617 923 2665

3 Nov Feeding Hills MA HCRA Auction @CongCh @7:30 Jim WA1ZUH 413 245 3228

4 Nov Interstate Repeater Society Londonderry NH Lions Hall

5 Nov Framingham ARA Framingham MA

18 Nov Newton MA WARA/1200RC Auction @Masonic \$2@11 Eliot W1MJ 617 484 1089

27 Jan Nashua NH NE Antique RC \$5@8 \$1@9 @ Res Ctr Church Joe 617 923 2665 F

18 Feb Westford MA GBARC Radio32 Antique @Regency @8 Tammy ARC 978 371 0512 F+

24 Feb Milton VT NVT WinterHamfest @8 @HS Rt7 Mitch W1SJ 802 879 6589

17 Mar Eastern Connecticut ARA

Pomfret CT. kelli@arri.net

25 March Framingham MA FARA @HS \$14/T@7:30 \$2@9 Bev N1LOO 508 626 2012

### NVARC Trading Post



When I volunteered to try to find a use for the plastic beads that a person I work with was trying to give away I had only a limited idea of how many would be coming my way. It took several months before they had all arrived. At that point there were about fifty cases. Each case contained fifty four thousand beads. It took eight one-gallon milk bottles to repackage one case of beads from the brittle cardboard boxes they arrived in. Some had more tape holding them together than cardboard. Over the past year I gave away about two hundred bottles of them. Several people picked some up for various groups after the last newsletter article. I'm happy to say that one person decided to take all the rest I had, about three hundred gallons of beads. I can finally get my car back in the garage. I hope everyone has fun with them. Stan



**Nashoba Valley  
Amateur Radio Club**

PO Box # 900  
Pepperell Mass 01463-0900

mailto:[nvarc\\_n1nc@arrl.net](mailto:nvarc_n1nc@arrl.net)  
<http://purl.org/hamradio/club/nvarc/>

Pres.: Erik Piip KA1RV  
V Pres.: OPEN  
Secretary: Ian Norrish NZ1B  
Treasurer: Ralph Swick KD1SM  
Editor: Stan Pozerski KD1LE  
Photographer Ralph Swick KD1SM  
PIO: Jon Kinney N1JGA  
Board Members  
Earl Russell 1998  
Bob Reif 1999

Den Connors 2000  
Meetings are held on the 3rd Thursday of the month  
- 7:30 p.m. - Pepperell Community Ctr. Talk-in  
146.490 simplex  
442.90 + 100Hz Repeater  
53.890 – 100Hz Repeater  
This newsletter is published monthly. Submissions, corrections and inquiries should be directed to the newsletter editor. Articles and graphics in most IBM-PC formats are OK. You can send items to [pozerski@net1plus.com](mailto:pozerski@net1plus.com)  
Copyright 2000 NVARC