NVARC
Nashoba Valley
Amateur Radio Club

SIGNAL

SPECIAL SERVICE CLUB
ARRL

de N1NC

September 2003 Volume 12 Number 9

This Month's Meeting

This month we resume regular meetings. The meeting will be held at regular time and place. That's 7:30 at the Pepperell Community Center.

Courtesy N1NK

Our speaker for this months meeting is Jim Spears, N1NK. Jim was a member of the 2002 CY0MM DXpedition to Sable Island and has put together a very interesting video presentation on his trip. The full crew is in the picture above and Jim is on the right.

Member Short Presentations

The November meeting program is going to be "Member Short Subjects". Our goal is to have four members do a ten or fifteen minute presentation on a topic of interest to them.

These presentations don't have to be radio related. It could be what you do when you're not "playing radio", or some other hobby you have.

We currently have three topics and speakers. If you have a short subject of ten or fifteen minutes that you would like to present contact a Board member. If you need help putting together the slides, need handouts copied, or need equipment we can probably help.

Adopt-A-Highway

The August clean up took place on the 24th. We had a great turn out and finished our section of road, the boat launch area, and the canoe launch area in about 50 minutes. Thanks to Pat N1VAV, Greg N1VAW, Ken KB1KFZ, Bob W1XP, Earl WR1Y, Larry KB1ESR, Jim AA1PO, Peter N1ZRG, Stan KD1LE, Scott WX1J, John KB1HDO, Ralph KD1SM, and Dave N1MNX.

The next cleanup will take place September 21st.

Due to construction at the schools last month we met at the river traffic island. Since this is centrally located and half the cleanup teams always start there I am moving the meeting place there permanently. As usual we will meet at 9:00 A.M.

NVARC Field Trip

Who, What, Where, Why, When?

The NVARC Field Trip to Green Mountain Power's Searsburg VT, Wind Power Facility took place 14 Aug 2003 after a postponement due to thunderstorms.

Stan Pozerski (KD1LE), Gary Busler (K1YTS), Dave Peabody (N1MNX), Wolfgang Seidlich (KA1VOU), Bob Reif (W1XP), and Karen Reif (KA1JVU) took the 2 and ¾ hour trek through scenic southern NH and VT to the wind farm. We also observed first hand the fine work of the VT road construction crews blasting, rock crushing, and paving numerous sections of Route 9. There were

of course traffic delays associated with these activities.

We were greeted on arrival by volunteer Walt Congdon (who happens to be W1ZPB), a retired science teacher and his assistant Nancy from CET (Center for Ecological Technology) who were our guides. Walt gave a talk at the substation about the requirements that must be met when choosing a site for a wind farm. They are wind, road access for construction, and High-Line nearby to deliver power to the grid. Other considerations are the impacts on local plants, wildlife (small and large mammals), and birds. Also important are aesthetics and local community acceptance. An additional criterion in the selection process was the desire for

a demonstration site for severe weather.

To put the above picture in perspective the nacelle, which houses the transmission and the generator, behind the blades is about the size of a minivan.

The Searsburg site came online in June of 1997 and at the time used state of the art equipment by Zond, now owned by GE Wind.

The site has 11 towers each assembled from 2-64' steel 18' diameter cylindrical sections. They are topped by a rotating nacelle that holds the hub attached to 3 black fiberglass blades each weighing 4200 lbs., the transmission that steps up the constant 29 rpm blade speed to 1200 rpm, and the generator. The cement pad at the base of each tower is attached to a 36' square 3' deep cement block covered by 2' feet of gravel.

Power is generated when winds reach 8-10 mph and the maximum power output of 550 kW per tower is reached at 29 mph. The pitch of the blades is changed to maintain 29 rpm. There is an anemometer, wind vane, temperature, and humidity sensor on top of each nacelle.

Above Stan taking pictures up in the tower as Wolf checks out the equipment.

Computers in the base of the tower use the instrument date to point the blades into the wind and to safely shut down in case of high winds. The tops of the blades are just below 200' above ground so the towers do need aircraft warning lights. There is a transformer at the base of each tower that converts the 440 volt power from the generator to 12 kV. The power is then fed to the sub-station lower on the hill site where it is transformed to 69 kV before being sent onto the power grid. This site generates power at a cost of 5.8 to 6.2 cents per kWh, which is in the middle of the range for Green Mountain Power generating facilities including wood chip, methane, and natural gas. The total cost of the plant was 11 million dollars and it provides enough power to serve 2000 average homes.

For more information about wind power check out the web site at AWEA.org (American Wind Energy Association or VERA at WWW.northeastwind.com.

By Wolfgang Seidlich (KA1VOU)

September Board Meeting

The Board meeting took place September 11th at the KD1LE QTH. There were wrap up discussions about Field Day and the cookout. WE worked out the final plans for the Grotonfest which is being coordinated by Ron W1PLW. There were also discussions on meeting programs for the upcoming year.

We could still use a speaker or two for the November members short topics meeting.

From the President

I hope everyone had a good summer as we now get back into the regular meeting season. The Fall program schedule is shaping up but we are open to suggestions on subject matter or specific speakers for future meetings.

Plans are coming along for our Ham Radio display at Grotonfest September 20th. If you can help or have ideas contact Ron W1PLW who has volunteered to coordinate this activity.

This one event was the source of most of the students that filled our license classes in the past. We will be taking signups for a class there and through the Pepperell Parks and Recreation. Pepperell Parks and Recreation will provide space and a town wide mailing. We have committed to running a class starting mid October.

We will be supporting the Pepperell Fall Classic Soccer Tournament Columbus Day weekend. John KB1HDO has taken on the coordinating task for this event. Help him out by volunteering some time during the three days of Columbus Day weekend.

We don't have a formal request yet, but I expect we will be asked to support he Groton-Pepperell Rotary Rail Trail Charity Walk in the Fall. This was a fun event in that many of us were bicycle mobile. This allowed us to cover the entire course and still

spend a lot of time stationary. The stationary time was often spent telling people what we were doing and talking about Ham Radio. It was a good opportunity for public relations work.

Stan KD1LE

Ham Radio History 101

Beginning Amateur Radio History

by Bob Reif W1XP

In last months column I described what amateur radio was like both from the regulations and operating point of view. This month I will describe how the events of Nov. 1923 set in motion discoveries that changed the scientific view of radio wave propagation and how radio amateurs did it all.

The Discovery of Ionospheric Radio Propagation

When French amateur station (f)8AB worked US station (u)1MO on Nov. 27, 1923 on a wavelength of 100 meters it started a change in thinking. It challenged the accepted view of radio wave propagation at that time. In 1912 when the federal radio law moved amateurs to wavelengths of 200 meters or less, the understanding by the experts of radio propagation was based on the low frequency experience and observation. This was a mode of propagation that is now classified as ground wave or surface wave. This is the mode used in the AM broadcast band for daytime ranges out to about 100 miles. In 1923 almost all communications was via this mode at wavelengths longer than 200 meters. Much longer wavelengths were used for some of the inter-continental stations. Remember longer wavelength is lower frequency. This mode of propagation is much better over seawater so it is quite useful for marine communication. The wave must be vertically polarized so it is not shorted out by the ground or seawater.

When the amateurs were moved to 200 meters there was not much of a prospect for long-range radio work. But the amateurs proved the experts wrong. Part of this was the improvement of equipment. From spark transmitters and galena detectors, to transmitters and receivers using vacuum tubes and CW emissions. And part was the existence of ionospheric propagation. We just didn't know it was there or how it worked. 200 meters is right on the boundary between surface wave and ionospheric propagation. Both modes exist. Certainly the ranges being worked regularly on 200 meters in 1923 can only be explained by propagation from the E layer. One explanation at the time was the Eccles-Larmor hypothesis. This hypothesis stated that a radio wave entering the Heaviside layer would be curved in its path just enough to travel along in the layer of ionization circling the earth. The Heaviside layer was 1923 terminology for the Ionosphere, named after Olive Heaviside who first proposed an ionized layer at high altitude over the earth. This was later called the Kennely-Heaviside layer before the term Ionosphere was adopted. This layer would transmit the energy of the wave with very little attenuation. To where isn't clear but only small amounts of the energy would dribble down from the wave passing overhead like rain from a cloud. Variations in signal level were supposedly caused by irregularities in the Heaviside layer. During the day, sunlight caused the formation of a layer of ionization at a lower altitude, which due to the high air density causes the radio wave to lose energy by collision of the ions. This is known today as the D layer. Not all aspects of this hypothesis were wrong. Another consequence of the Eccles-Larmor hypothesis is that the height of this wave layer is directly related to wavelength. Shorter waves, lower the wave layer height. So the Short Waves move closer to the earth where they are absorbed. But when the amateurs moved down to 100 meters and demonstrated the ability to communicate across the Atlantic, and do it consistently, the Eccles-Larmor hypothesis came under serious doubt. The accepted view that the short waves were useless was finally investigated. More to the point an investigation in to how these short waves were really propagated was started, and radio amateurs did much of this investigation.

In early 1924 John Reinartz 1XAM and 23 other amateurs scattered across this country and in Western Europe started tests that ran for over a year. This work in the area of 60 to 20 meters involved transmissions by 1XAM and monitoring of his signals. These tests were carried out at all hours and over many wavelengths. Most of the tests were done with 1XAM working one of the other stations involved and the others listening for and reporting on the signals. It was a big effort. Over 5000 reports were submitted and analyzed before the results were summarized in the April 1925 QST, by John Reinartz. In this just under four-page article he outlines the prominent characteristics of ionospheric radio propagation at what are now called High Frequencies. In 1925 it was the "short waves". He outlines the nature of the ionosphere and its relationship to the sun. Specifically, that the height of the ionosphere changes

during the day and is at maximum height at midnight and minimum at noon. He did not speculate on the change in intensity of ionization. He makes the observation of the existence of a skip zone to a signal. Commenting on how the skip zone changes in dimensions with wavelength and time of day for the path. The existence of the skip zone is the strongest support for the reflection hypothesis. It was probably the most important discovery of the tests, because it is the predominant characteristic of HF ionospheric propagation. There is a footnote here that the skip zone was observed by an amateur who wrote a letter to the editor of QST before W.W.I. He ask if anyone could explain his observation that signals from far stations where on many occasions better than those of similar equipped stations at closer range. And that some time these closer stations could not be heard at all but had been excellent copy earlier or later. The letter seems to have fallen on deaf ears. But this was not missed by the group of observing amateurs in 1924. It is pointed out in the article that the amount of power used does not have any effect on the skip zone but does have an effect on the size of the area covered. This sounds a bit confusing but what he is saying is that no amount of power can get you into the skip zone. But that power can still affect the size of the area a signal can be heard in. I think the point here is that there is an area in the "skip zone" that the transmitting station cannot be detected. The characteristic change of the operating frequency from a lower limit to higher limit and then back to a lower limit as the day progressed was also brought out as well as the fact that the signal strength for a given path and wavelength followed a characteristic pattern as the time of day changed. The important point here was recognition of the link between the sun and propagation on both a day-to-day and yearly basis. The effects of the sun spot cycle had not even been suspected yet. Our observation window was still too narrow. They also reported the fact that the effective height of reflection of the wave in the ionosphere increases with frequency, and that waves entering the ionosphere at lower angles are propagated to a farther distance.

This was revolutionary work and paved the way for the work that has continued to this day. True we have learned much since then and still have much to learn. There is one thing that the article does not mention. That is the possibility of multiple hops. There is the suggestion that the more distant paths may be caused by multiple reflections from the ionosphere but not involving reflection form the earth. This possibility is still being investigated and is thought to be the cause of unusual propagation on six meters among others. John got one thing wrong. He fell into the same trap that the professionals had in 1912. They were guilty of extending the current theory into uncharted territory. In 1925 John Reinartz predicted that an international contacts would be made directly on wavelengths below 1 meter before the year was out. By this he meant that the magic that is HF ionospheric propagation would extend beyond 300 MHz. He was only off by a factor of ten. But still we owe these pioneers much for the ground they plowed before us. Much of the benefits and respect we enjoy today was earned by these early amateurs who didn't listen to the experts of the day.

As an example of this amateurs were invited to go along on many scientific expeditions and future articles will high light some of these. In 1925 the US Navy requested an amateur take and operate an amateur short wave station on board a Navy ship as it sailed from the west coast to the south pacific. A good example of the respect amateur radio was achieving in the few short years since we were shuffled off to Below 200 meters.

One last note of interest, the same issue of QST that carried John Reinartz's article on the Reflection of Short Wave Signal by the Heaviside layer also carried the obituary of Oliver Heaviside.

Till next time, 73 Bob W1XP

NVARC Cookout

The Annual cookout took place August 16th. Den KD2S hosted the event again this year. We chatted, cooked, ate and monitored the weather radar for the thunderstorms that threatened the area. In the end only a few brief showers passed over.

There was the space by the pool occupied by Lynda N1PBL, Rose KD2S XYL, Pene, and Mary-Lou N1ZRG XYL

There was the screened porch with the network feed staffed by Jim N8VIM and Jim's brother Mike on the left and John KB1HDO on the right with Peter N1ZRG and Den KD2S outside doing cooking duty.

The 'fixins' were laid out on the porch. Relaxing nearby (L-R)) are Den, Karen KA1JVU, John Ralph KD1SM, Erik KA1RV, and Bob W1XP.

Not seen in pictures Gary K1YTS and Nancy KB1KEF.

Thanks to Den and Rose for putting up with us for another year.

PSList September 2003

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.

The most up-to-date copy of this list is maintained as
http://purl.org/hamradio/publicservice/nediv

Every event listed is looking for communications volunteers

Date Location Event
Contact Tel/Email

Sep 19 Plymouth to Sandwich ALA Autumn Escape Bruce KC1US 781-275-3740 KC1US03@amateur -radio.net

Sep 20 Sandwich to Brewster ALA Autumn Escape Bruce KC1US 781-275-3740 KC1US03@amateur -radio.net

Sep 21 Brewster to Provincetown ALA Autumn Escape Bruce KC1US 781-275-3740 KC1US03@amateur -radio.net

Sep 21 Madison to Moodus CT Bike Tour for MS
Scott AA1WM 203-676-1016 aa1wm@arrl.net

Sep 21 Boston Jimmy Fund Walk
Steve W3EVE 508-384-7697 w3eve@arrl.net

Sep 22 Moodus to Madison CT Bike Tour for MS
Scott AA1WM 203-676-1016 aa1wm@arrl.net

Oct 11-13 Pepperell Fall Classic Soccer Tournament
John KB1HDO 978-772-5406 kb1hdo@hotmail.com

Sep 12 Boston BAA Half Marathon
Bob WA1IDA 508-650-9440 wa1ida@arrl.net

Oct 17-19 Boston MA Head of the Charles Regatta
Jeff N1FWV 978-536-2842 rwjeffa@attbi.com

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

From The ARRL Letter and Bulletins

FCC INVITES COMMENTS ON SIX MORSE CODE-RELATED PETITIONS

The FCC has invited public comments on six separate Morse code-related petitions for rule making, some of which would altogether eliminate Element 1, the 5 WPM Morse test, from the Amateur Service rules (Part 97). World Radiocommunication Conference 2003 (WRC-03) made optional the requirement to prove the ability to send and receive Morse signals to operate below 30 MHz.

A petition from Peter M. Beauregard, KI1I, designated RM-10781, would give all Technician licensees current Novice/Tech Plus CW privileges on 80, 40, 15 and 10 meters and limited phone and image privileges on 80, 40 and 10 meters. Beauregard said the CW privileges would "encourage Technician class licensees to upgrade to General" by giving them a "practice area." He has proposed new Tech phone/image privileges on 3850-3900 kHz and 7225-7300 kHz. His petition would not eliminate Element 1, however.

Pete V. Coppola, KG4QDZ, and family--Tina Coppola, KG4YUM, and Pete A. Coppola, KG4QDY--have asked the FCC to eliminate Element 1 from the rules. The Coppolas' petition, designated RM-10782, would grant Tech Plus HF privileges to current Technician licensees. It also would retain the current CW-only subbands. The Coppolas asked the FCC to make the change effective immediately on a provisional basis.

Kiernan K. Holliday, WA6BJH, has asked the FCC simply to "remove all requirements for knowledge of Morse code" from the Amateur Service rules. Holliday said there is less reason to require Morse code in the Amateur Service today. In his petition, designated RM-10783, Holliday also said the code requirement limits the ability of handicapped individuals to get ham tickets. "The Commission's policy should be to encourage the use of Amateur Radio," he said.

Dale Reich, K8AD, petitioned the FCC to delete Element 1 for General class applicants but keep it in place for Extra class applicants. Under Reich's scheme, "no-code" Techs wanting HF privileges would have to upgrade to General first. Reich's petition is designated RM-10784.

Eric Ward, N0HHS, seeks immediate elimination of "proficiency in telegraphy using Morse code." The "immediate removal of the telegraphy requirement from Amateur Radio licensing is appropriate and clearly in the public interest," Ward contended in his petition, designated RM-10785.

In a detailed, nine-page petition, the National Conference of Volunteer Examiner Coordinators (NCVEC) is calling on the FCC to delete Element 1 and give "Tech Plus" privileges to current Technician licensees. The NCVEC also asked the FCC to "take expedited action" to allow volunteer examiner coordinators (VECs) to discontinue administering Element 1 "as soon as possible."

"The Amateur Service community suffers from the loss to its ranks of a large number of potentially excellent operators who are turned away because of the CW requirement," the NCVEC petition said.

The organization, the umbrella group for the 14 VECs in the US, said there's "no longer any reasonable justification for requiring an applicant to demonstrate this antiquated skill," and that most applicants never use Morse after they pass the test. The NCVEC petition is designated RM-10787.

The ARRL-VEC abstained from voting on the NCVEC's petition question when it came up during the NCVEC's July 25 meeting in Pennsylvania. At its own July meeting in Connecticut, the ARRL Board of Directors affirmed its interest in reviewing members' input on the Morse issue as well as on other possible revisions to Part 97 arising from

WRC-03. The Board's current position is to retain the Morse requirement for HF access.

Two more recently filed petitions--one from No Code International and another from two amateur licensees--are expected to be put on public notice in the near future.

Interested parties may file comments on any or all of these petitions using the FCC's Electronic Comment Filing System (ECFS) <http://www.fcc.gov/cgb/ecfs/>, which also permits users to view the petitions and all comments on file. There is a 30-day comment window.

To file a comment, click on "Submit a Filing" under "ECFS Main Links." In the "Proceeding" field, type the full RM number, including the hyphen, and complete the required fields. "RM" must be in capital letters, and you must include the hyphen between "RM" and the five-digit number. You may type your remarks into a form or attach a file. ECFS also accepts comments in active proceedings via e-mail, per instructions on the ECFS page.

While a Morse code exam element remains on the books in the US, Canada and elsewhere, a handful of countries--including Switzerland, Belgium, the UK, Germany, Norway and the Netherlands--already have moved to drop their Morse requirements. Austria and New Zealand are expected to do so soon.

HAMS A BRIGHT SPOT DURING POWER BLACKOUT

When a power blackout struck at least a half dozen eastern states August 14, many Amateur Radio operators were ready and able to provide whatever assistance they could. Hardest hit were metropolitan areas like New York City, Detroit and Cleveland. In New York, residents and commuters found themselves stranded in electricity-dependent elevators and subway or rail cars while visitors ended up stuck at airports, which were forced to shut down. With the cellular systems overloaded or out altogether, the incident turned into a test of Amateur Radio's capabilities to operate without commercial power.

"It was a good drill," said New York City-Long Island Section Emergency Coordinator Tom Carrubba, KA2D. But, he adds, it was a cautionary tale too. "The lesson is that everybody gets a little complacent," he said. "Have emergency power backup and make sure it's working!"

By and large, Carrubba said, ARES members did what they were trained to do. "It's going to show the worth of Amateur Radio," he said of the blackout response. "There were people on the air immediately."

Diane Ortiz, K2DO, the Public Information Coordinator for NYC-Long Island was one of them. When power went down in her Suffolk County community, she started up an informal VHF net. Over the next 20 hours or so, it passed some 500 pieces of what Ortiz described as largely "health-and-welfare traffic."

"People are getting on and helping," she said. In addition to handling messages for people stranded in the city, amateurs also relayed useful information, such as which stores or filling stations were open and operating. With many radio and TV stations dark, and hams were able to help fill the information void, Ortiz said.

In the Big Apple itself, ARES teams provided communication support for Red Cross Emergency Response Vehicles (ERVs) set up at main transportation centers in Manhattan. ARES members also accompanied ERVs on fire calls.

RACES activated in most Greater New York City area counties after a state of emergency was declared. Some ARES teams--including a few across the Hudson River in New Jersey--activated or remained on standby to help if called upon. In New Jersey, a net linked the Red Cross lead chapter's N2ARC in Princeton with other New Jersey ARC chapters.

Michigan Section Manager Dale Williams, WA8EFK, reports scattered ARES activations. Williams, who lives in Dundee south of Detroit, was without power August 15 and relying on his emergency generator. Some Michigan ARES teams assisted emergency operations centers and the Red Cross.

In Ohio, Section Emergency Coordinator Larry Rain, WD8IHP, reports that all ARES organizations in northern Ohio were activated after the power grid went down. Still going strong at week's end were ARES teams in Cleveland and Akron. "ARES is handling communication support for Ohio Emergency Management in the affected cities and communities," Rain said. Ohio VHF and UHF nets and the Ohio SSB net on HF have been handling blackout-related traffic.

Nancy Hall, KC4IYD--who lives 20 miles west of Cleveland--said she's glad she'd taken the ARRL Emergency Communications Level I class. "I have to say that being a ham and knowing about emergency preparedness did make life easier for me and my family," said Hall, who's now signed up for the Level II class.

New England states were far less affected by the blackout. ARES/RACES operators in the region were on standby after the blackout. Only Connecticut and sections of Western Massachusetts reported significant outages, and ARES nets activated in both states.

Bill Sexton, N1IN/AAR1FP, an Army MARS member, said his emergency power capability permitted him to check into the Northeast SHARES (National Communications System HF Shared Resources Program) net and maintain e-mail contact after Berkshire County lost power.

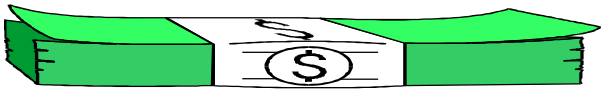
"The experience proved once gain the great strength of ham radio in an emergency," Sexton said. "It is self-starting, and it is everywhere."

NVARC Loaner Equipment

Kenwood TS-451 transceiver
Cushcraft R-7 antenna
Astron RS-35M power supply
Practice Oscillators MFJ557 Keyer

$September Treasurers Report$

Income for August was $35 in membership dues, $.01 from the road cleanup, and $4 from mug sales. Expenses were $14.80 for newsletter postage, $17.69 for a final Field Day expense, and $25.72 for the picnic leaving a net expense of $19.20 for the month.



Current balances:

General fund	$4622.70
Community fund	$1842.55

Welcome to new member Ken Young KB1KFZ.

Can we persuade you to support ARRL and its educational activities on behalf of Amateur Radio? Membership in ARRL is a way to show appreciation for the many outreach programs. If you are not yet an ARRL Member and wish to become one, consider letting NVARC handle the paperwork for you. ARRL rebates a portion of new membership dues back to the Club. There is no longer an ARRL rebate for ordinary membership renewals handled through the Club.

73,
Ralph KD1SM

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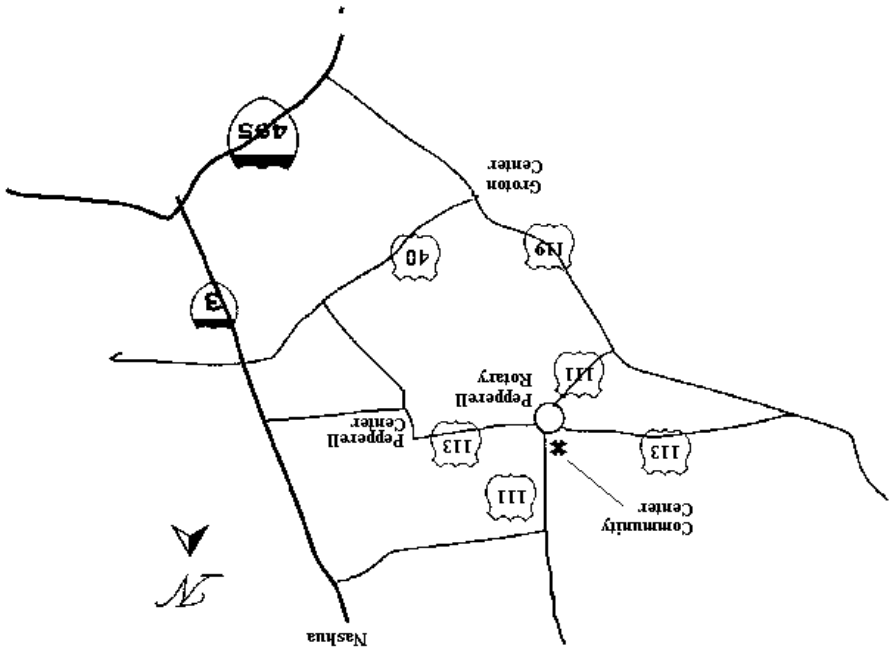

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