NVARC
Nashoba Valley
Amateur Radio Club

SIGNAL

SPECIAL SERVICE CLUB
ARRL

de N1NC

December 2002 Volume 11 Number 10

This Month's Meeting

The December meeting program is Homebrew night. Times up so wrap up those projects and bring them in. This meeting is as good as we make it.

As was mentioned in the November Signal every homebrew project that is powered by a Powerpole connector entitles the owner to one free ticket to the book drawing up to a limit of two free tickets.

Earl WR1Y will have a laminator for people who need their license or other card-sized items protected

Bring your outgoing QSL's to the meeting and have the club send them out. See Bob W1XP.

Bring your short Shows-and-Tell to the meetings. They are always welcome. Its always interesting to see the variety of things people are working on.

December Board Meeting

The December Board of Directors Meeting was held December 12th at the KA1RV QTH. Erik KA1RV, Ralph KD1SM, Earl WR1Y, Les N1SV, Bob W1XP, and Stan KD1LE were in attendance.

Ralph presented the Treasurers report to the Board and it is published later in the newsletter.

Ian reported the last PO Box key has been swapped at the new Pepperell Post Office.

Den sent information on customized mugs he had researched. The Board is considering some kind of NVARCware to be used for awards and speakers gifts.

The Board is encouraging everyone to bring their homebrew projects to the regular meeting because this meeting is as good as the members make it. No project is too small and it doesn't have to be radio related. Also remember each project powered by a Powerpole Connector gets the owner a free ticket to the book drawing (up to a maximum of two free tickets).

At the meeting the FoxFinder group announced that due to declining sales and interest in other activities they are discontinuing sales of FoxFinders through the club as of December 31st. The project benefited the club by approximately $5100 over the past three years.

Ron KB1GID reported the Townsend Cable Access meeting has been postponed again. The new date is in January.

The Board discussed having more member presentations and is soliciting three or four members to do a ten or fifteen minute presentation on a "Special Short Subjects Nite."

We have one volunteer for the position of Property Master. If anyone else is interested see Erik at the meeting.

Club Email Reflector

The club email list will be available soon. Members need to opt-in to the list. Contact Ralph or send him email at kd1sm@arrl.net. Posting to the list will be limited to subscribers.

Last Month's Meeting

Last month Mike Raisbeck K1TWF, who is the ARRL New England Vice Director, talked about new League activities.

Jim N8VIM brought pictures he has taken of the Pepperell and Nashua area from the air during his flying lessons.

A rough draft of new club web page was passed around for discussion.

Foxbox Hunts

The Foxbox came in during the snowy early November weather but it was again deployed the end of November. The snows of the last few weeks have probably brought it in for the Winter unless the ground clears.

Recently the hunters who have signed in at the fox are Barry W1HFN, Larry KB1ESR, Gary KD1TE, Bob W1XP, John KB1HDO, and Stan KD1LE. Recently the foxbox spent several weeks hidden on the Skitapet Conservation Land in Groton and at the Small Town Forest in Lunenburg.

If you have any questions about Fox Hunting or need a hand getting started see Ralph KD1SM or Stan KD1LE.

Capacitors

How to choose them.

If you look in any modern parts catalog, you will find almost a hundred pages of capacitor listings. With this large a selection of parts to choose from how, can you make an intelligent choice? This dilemma was mentioned to me, and the suggestion made that a short article on the various issues at hand when selecting a capacitor for any particular application might be a good idea. So here it is. After reading this article, you will have a better idea of what capacitors to choose for any particular application.

Capacitors are used everywhere and for many different reasons. They may be used to store energy on the output of a rectifier circuit in a power supply or they may tune a resonant circuit in a UHF transceiver. In fact, all capacitors, like its sister component the inductor, store energy. That is their only function although it is more common to think of capacitors as bypass, coupling, blocking, filter or tuning capacitors. In all of these applications it is the capacitors ability to store electrical energy in an electrostatic field, and later return it to the circuit, that allows them to fulfill the applications listed above.

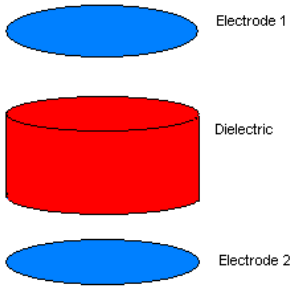


Figure 1 Basic Capacitor Construction

Capacitors, in the simplest form, consist of two parallel plates of conductor separated by a dielectric. See figure 1. In the simple case the dielectric may be air or vacuum. If we replace the air dielectric in this capacitor with almost any other non-conductor, the capacity of the capacitor increases. This is because the molecular lattice of the insulator allows more energy to be stored in the capacitor at any given voltage. This property of the dielectric material is called its dielectric constant and it is a unit less ratio greater than one (air being one). If we replace a dielectric with a second dielectric that has twice the value of dielectric constant of the first, the value of the capacity doubles. So, the larger the dielectric constant we can use the smaller the physical size we can make the capacitor for any given capacitance value. The search has always been for insulators with greater dielectric constants. That is only half the problem. All insulators have a second property. This is dielectric strength. This is the ability of the dielectric to withstand high voltage per unit of thickness. It is usually measured in Kilovolts per cm. A higher dielectric strength means that the dielectric layer may be thinner for a given working voltage. This allows a higher value of capacity for a given size of capacitor package at a given voltage. (This is starting to get complicated.) Another issue to consider is the behavior of the dielectric with temperature. If the dielectric changes physical size, dielectric constant, or both with temperature change, then the capacity of the capacitor will also change with temperature. This may not be a big issue in some applications. If the power supply filter capacitor is big enough at all temperatures, then the fact that it changes value twenty-five or more percent is probably not an issue. On the other hand, if the capacitor, that tunes an oscillator, changes one percent over the expected temperature range you probably will not be pleased with the results. This variation in capacity with temperature is the capacitors temperature coefficient (TC). It is measured in Parts per Million per degree Centigrade. Some caps are as low as +/- 30 PPM/Deg C. Aluminum electrolytic capacitors (to be discussed later) are as high as +2500 PPM/Deg C. One more area to consider when choosing a capacitor is the loss

the capacitor has. No insulator is perfect. All have some finite resistance, which allows a (real) leakage current to flow between the plates. This is different than the capacitor current that flows in the charging and discharging of the capacitor (imaginary current for those keeping track of the complex math). This resistive current in the dielectric is a loss of the stored energy in the capacitor. There is also the resistance of the conductors that make up the electrodes and leads of the capacitor. This resistance also causes energy loss as the charging and discharging current flows through the conductors as it enters and leaves the capacitor. These two sources account for the energy lost in a capacitor. This is usually expressed as a ratio of the equalivant series resistance over the reactance of the capacitor at a specified test frequency. You may recognize this as the inverse of the capacitor Q. This is called the dissipation factor (DF). The larger the dissipation factor the more loss the capacitor has at the test frequency. Dissipation factor is usually expressed as a percent. The fact that the dissipation factor can vary by orders of magnitude from one capacitor type to another can make a lot of difference in the final performance of some circuits. Choosing the right capacitor can have a big effect on the outcome of your project and to do so you must choose the right dielectric. For in reality that is the choice you are making when you pick up the part and put it in the circuit.

The choices are pretty easy and straightforward most of the time. It is being able to recognize the cases where more care needs to be used in selection and then knowing what component to choose that can save a lot of head scratching (and headache) later. In many ways this comes down more to understanding how the circuit works and what the function of the capacitor is, than it does to understanding the capacitor types. You first need to understand the capacitor requirements before you can select the right component. However, given that you understand the components purpose in life you are well on the way to making the right selection. Let's talk a bit about the common types of capacitors you have to choose from.

Electrolytic capacitors typically use an electrolyte to form a film on a metal. This film has a high dielectric strength and dielectric constant. This is just what we require for large value capacitors. In many cases, these capacitors are made using a thin aluminum foil treated with an electrolyte and then rolled up in a cylinder to reduce the volume. These aluminum electrolytic capacitors are reasonable in size, have large capacity, and can be built with high working voltage. Four hundred to five hundred volt units are common. They typically require a dc voltage across them when in service, and must not be subjected to reverse voltage at any time as this will lead to failure of the capacitor. Because of this the capacitor is marked to indicate the positive and negative leads. As mentioned above the TC can typically be as high as +2500 ppm. Some bargain brands are probably higher. The maximum temperature range is –40 to +80 degrees C. This is usually not a big issue with amateur applications. But beware some parts may have a much narrower temperature range. They have a poor DF but other than being a source of heat in the component this is not usually a problem. These capacitors are typically used for power supply filtering, audio coupling and bypassing, and energy storage.

Another form of electrolytic capacitor uses a tantalum oxide dielectric. These capacitors are smaller than the aluminum capacitors but are not available in high voltage units like the aluminum electrolytic capacitors. Aluminum electrolytic capacitors have a limited shelf (and service) life. The tantalum capacitors do not. The tantalum capacitors are suitable for use at higher frequencies than the aluminum capacitors. They will withstand limited application of reverse voltages. Non-polarized tantalum capacitors are available but this can be accomplished by connecting two identical tantalum capacitors of twice the desired value back to back. With regard to useful frequency range, I think a simple rule is if you can find the value of required capacity in a ceramic or film capacitor (which we will discuss later) then don't use an electrolytic (tantalum or aluminum.) Tantalum capacitors are better than aluminum capacitors but neither is suitable in critical applications where precise control of the capacity is desired. Tantalum capacitors typically have a wider temperature range. Minus 55 degrees C verses –40 for the aluminum caps. The TC of tantalum capacitors is about one third of the aluminum caps, +800 PPM/C. In terms of loss or dissipation factor, the tantalum is about two and one-half times less than aluminum capacitors. They are a bit more expensive but because of improved performance of the tantalum capacitor in most areas I would choose a tantalum over an aluminum capacitor whenever possible.

Film capacitors are the new big kid on the block. They trace their ancestry back to capacitors made with a paper dielectric separating two sheets of thin metal foil. This was rolled up and sealed in a cardboard tube. These capacitors were cheap but not very reliable. The current film capacitors are made by depositing a metal film on the plastic film dielectric. Strips of film are then rolled up in a tight roll and the leads attached. The capacitor is then sealed in a plastic tube or dipped in epoxy. These capacitors are much more reliable than the old paper dielectric capacitors. The paper tended to have imperfections that lead to dielectric failure. The polymer that the films are made from is much more uniform. This leads to a more consistent part, more stable characteristics and better reliability. It is the development of these better film dielectrics that has brought new life to this old style of capacitor construction. Polycarbonate, Polyester (Mylar), polypro-

pylene, polystyrene, polysulfone, and Teflon (just to name a few) are being used to make capacitors of this type. This wide range of dielectrics offers many distinct advantages. They are all excellent capacitors and can provide a wide range of desirable characteristics. The polycarbonate film can provide low TC, +/- 50PPM/C. This is as good as Mica (to be discussed later) but their DF is several orders of magnitude poorer which may be an issue. Polyester (Mylar) caps may have +400 PPM TC and polypropylene is –200 PPM. So you might get different results depending on the film capacitor you choose. Polystyrene film has a –120 PPM TC, which has been recommended by some writers to temperature compensate inductors wound on powered metal cores. It also has an extremely high insulation resistance, which makes it a very good capacitor for sample and hold type applications in spite of the fact that the DF is not the lowest. This seems to suggest that not all the loss is in the insulation resistance of the dielectric. These parts are quite suitable for most critical applications from audio to the low VHF frequency range. Just which film you select may make a difference. They have reasonable loss, are small, and low in cost. The down side is that they tend to be lower voltage units and somewhat larger than ceramic caps which we will discuss next.

Ceramic capacitors are probably the most used style. They have a ceramic dielectric, which is made by mixing a slurry with various other components to modify the dielectric properties, casting it into thin sheets and spraying on a pattern of conducting ink. They are then fired as any other piece of pottery, broken up into individual units, leads attached, and encapsulated or dipped in a protective coating. Larger value units may have multiple layers to increase the capacity. Some may have end electrodes added and are known as chip caps for direct mounting on the circuit board (surface mount). Because of the nature of the dielectric material, they can be modified to provide a very wide range of characteristics. Very large capacity values in small packages are possible on the one hand, and very stable or controlled temperature chacteristics are possible on the other. There are many possibilities in between. For this reason it is not possible to predict what the characteristics of a ceramic capacitor may be by its style alone. It may be a Guaranteed Minimum Value (GMV) unit where the value of capacity is guaranteed to be greater that the marked value. These would be suitable when a circuit will function properly with any capacity above a certain value. Another capacitor may be a negative positive zero (NPO) capacitor with a +/- 30 PPM TC which is a very stable part. A third capacitor may have a specific negative TC that is intended to compensate other components in a circuit. This is where you really need to know what it is you have if you are planning to use some part you dug out of the junk box. All those letters and numbers on the capacitor mean something and knowing what they mean can help you understand what you have. There are more identifying systems than you can keep track of. I won't begin to try to cover that here. A quick look at some of the catalog data isn't a lot of help either. As usual, it is what they don't say that is important. Therefore, you are back to the vendor to look at the data sheet. With the web this is getting easier.

Ceramic capacitors are available in high voltage units. Up to 20 and 30 KV and higher. Some amateur antenna trap designs use these high voltage capacitors. They are also used in vacuum tube amplifiers for coupling and bypassing. From 50 volts to 50 kilovolts, you probably can find a ceramic capacitor to do the job. They are useful from audio or lower to well into the UHF spectrum. They are small and inexpensive.

Mica capacitors are another old design of capacitor. They were used in very early radios and are still a very good choice for most critical applications. Mica has very low loss and as a result mica capacitors have the lowest DF of the common types. Mica also has a very low temperature coefficient, +/- 50 PPM. Mica is a natural occurring mineral and as a result can have many different forms. It can be split into very thin and uniform plates. Some plates are as thin as .00025 inch thick. The method of construction today is to use a thin mica dielectric plate and coat it with a thin layer of silver on each side. Multiple layers are stacked up for higher values of capacitance. Mica has a high dielectric strength so very high voltage capacitors are possible. The dielectric constant of Mica varies between three and six so mica capacitors tend to be larger than ceramic capacitors. Some capacitors are packaged by dipping in an epoxy coating. Others are molded in a plastic case. These are excellent capacitors for use in the HF and VHF range. These capacitors typically have wire leads, which limits the higher frequency use of the capacitor. Before the development of chip capacitors, some mica capacitors were built in button form to keep the lead inductance down. These were the "Gold Standard" of VHF bypass capacitors. The dipped silver mica capacitor is a good choice for any HF or low VHF application that requires a stable low loss capacitor. They are larger than ceramic capacitors and therefore a given value capacitor will tend to have a lower resonant frequency. This is due to the larger parasitic lead inductance. However, they are still a good choice for many applications.

Glass capacitors are made similar to the molded mica caps. Glass is a very good dielectric in terms of loss and temperature stability. The dielectric constant is around five. Like mica, it does not have the versility of ceramic in terms of the ability to tailor the dielectric to meet different requirement. Except for some special applications, glass has been replaced by

the more versatile film and ceramic capacitors. One story I remember regarding glass capacitors is the glass capacitor arrangement that my “Elmer” told me about years ago. In the 1920s he had a 40-meter CW rig that was a large push pull vacuum tube oscillator. I guess it ran several hundred watts. The grid and plate tuning capacitors were made of large metal plates and the oscillator frequency was tuned by sliding a piece of window glass in and out between the capacitor plates. This was good enough to be heard all the way down to Tierra del Fuego. Not bad DX in the early 1920s.

This pretty well covers the current variety of capacitors. I have not covered variable capacitors at all and there are a few types that I have omitted. I hope that you now have a better idea what capacitors you might use for a particular application. The ground rule is if the requirement is critical then you need to fully understand the characteristics of any capacitor (or any other part for that mater) that you use in the circuit. That may mean that you have to do your homework and dig out the data sheets on the part before committing it to the circuit. Just any old capacitor may not do at all. The many different chacteristics of capacitors make their selection something that needs to be considered more closely than just matching the value on the schematic. Happy Holidays Bob W1XP

NVARC Power Distribution Boxes

The Power Distribution Box Kits were available at the October meeting. Most of the second run of the kits are now gone. We have no plans to put together more kits at this time. If you still need/want a kit or kits see Stan before they are gone.

Adopt-A-Highway

On November 24thth we performed our last road clean up of 2002. There was a good turn out and we picked up sixteen bags of trash in about 50 minutes.

The November cleanup crew included Bob W1XP, Peter N1ZRG, Stan KD1LE, Pat N1VAW, John KB1HDO, Ralph KD1SM, Earl WR1Y, and Erik W1ZBT.

Thanks to everyone who helped out.

From The ARRL Letter and Bulletin

HAMS RESPOND TO NORTH CAROLINA STORM CRISIS

Accompanied by the worst power outages since Hurricane Hugo in 1989, a severe storm swept along through the Carolinas early Thursday, December 5, prompting area Amateur Radio operators into action to help with the emergency.

Over 1.5 million people in North and South Carolina were without power December 6 and power was not expected to be restored to many residents until after the weekend. Governor Mike Easley declared a state of emergency in North Carolina as a half inch of ice coated central North Carolina. Four people were killed in North Carolina.

ARRL North Carolina Section Public Information Coordinator Gary Pearce, KN4AQ, said "SKYWARN nets operated overnight across the state, providing the NWS updated information on changing ground conditions."

While the statewide ARES net was not activated Thursday, the North Carolina state EOC in Raleigh was staffed with hams helping to pass traffic between there, county EOC and the state's 25 open shelters.

WRC-03 CONFERENCE PREPARATORY MEETING EXPANDS 40-METER OPTIONS

Paul Simon sang of 50 ways to leave your lover, but participants at the just-ended Conference Preparatory Meeting (CPM) for World Radiocommunication Conference 2003 heard just five ways to fix 40 meters, plus a sixth that would just leave things as they are.

"The five options for change all represent improvements in the amateur band, although two fall short of fulfilling the 300-kHz worldwide requirement," said ARRL Chief Executive Officer David Sumner, K1ZZ. He
attended the Geneva gathering in his role as International Amateur Radio Union (IARU) secretary. "All six options maintain the existing 300-kHz exclusive amateur allocation in Region 2."

The objective of the CPM was to complete work on a 700-plus page extensive technical CPM Report, which outlines methods to address the more than three dozen items that are on the WRC-03 agenda. As for amateur issues, Sumner says 7-MHz realignment or harmonization "is one of the most difficult issues facing WRC-03." As he explains the situation, three major interests--amateurs, shortwave broadcasters, and users, mainly military, of the fixed and mobile services--have a stake in the outcome.

The IARU is on record as supporting a 300-kHz worldwide amateur allocation in the vicinity of 7 MHz. Sum-

ner said achieving this would require the fixed and mobile services to make room for broadcasters and for the broadcasters to change their operating frequencies. The five methods for change the CPM Report describes include a variety of transition schedules to ease the impact on these other services.

Method A would shift Region 1 and 3 broadcasters up by 200 kHz to 7300-7550 kHz in two stages and would provide the same band for broadcasting in Region 2.

Method B is similar but would have amateurs in Regions 1 and 3 sharing he upper 100 kHz of their newly expanded band with fixed and mobile.

Method C would provide just 200 kHz for amateurs in Regions 1 and 3. Amateurs in Region 2 would continue to contend with broadcasting interference from Regions 1 and 3 in the 7200-7300 kHz segment.

Method D, proposed by Canada at the CPM, would provide 300 kHz worldwide for amateurs by shifting broadcasters in Regions 1 and 3 up by 200 kHz but would not expand the Region 2 broadcasting allocation. This plan would minimize the impact on fixed and mobile services in Region 2.

Method E, proposed by the Republic of Korea at the CPM, would provide amateurs in Regions 1 and 3 with an additional 100 kHz shared with fixed and mobile (7100-7200 kHz). As with Method C, however, Region 2 amateurs would continue to face broadcasting interference from Regions 1 and 3 in the 7200-7300 kHz segment.

Method F, proposed by Australia at the CPM, would simply maintain the status quo. This plan reflects concerns about the impact of realignment on military and national security communications capabilities.

"There is no guarantee that proposals will be limited to the six methods described in the CPM Report," Sumner said.

Amateur Radio was well represented at the CPM. Chairing the CPM was Eberhard George, DL7IH, of Germany. A three-member IARU team was headed by President Larry Price, W4RA, and included Sumner and Wojciech Nietyksza, SP5FM. ARRL Technical Relations Manager Paul Rinaldo, W4RI, served as a member of the US delegation. He also was named to chair the ad hoc group that dealt with the substance of the 7-MHz text. Several other amateurs were on their national delegations, some of them specifically to represent Amateur Radio and others in professional capacities. IARU Vice President David Wardlaw, VK3ADW, was on the Australian delegation.

Sponsored by the International Telecommunication Union (ITU), the CPM drew more than 1000 participants to Geneva during the last two weeks of November. Over the next three months, regional telecommunications organizations and groups (CEPT, CITEL, and Asia-Pacific Telecommunity, the African Telecommunications Union, and Iran and the Arab States) as well as individual administrations will be developing their proposals for WRC-03, which takes place in Geneva next summer.

FIRST AMATEUR TRANSATLANTIC HF DIGITAL VOICE QSO REPORTED

Radio communication pioneers Ten-Tec and Thales have announced that they've used an Amateur Radio linkup to span the Atlantic on HF digital voice for the first time. Ten-Tec's Doug Smith, KF6DX, and Thales' Didier Chulot, F5MJN, successfully transmitted and received HF digital speech signals November 22 between Paris, France, and Ten-Tec's Sevierville, Tennessee, headquarters.

"We view this as a significant accomplishment," said Smith. "Amateur Radio has long been at the forefront of technological development. It's nice to be able to show that our legacy is alive and well." Tests are being conducted under the auspices of ARRL's Digital Voice Working Group, which Smith chairs. A written report on the tests is due in January.

Calling it "a major breakthrough," a Ten-Tec news release said the two amateur stations "demonstrated the advantages of digital audio during the conversation, including noise-free, FM-like reception and the potential for simultaneous voice and data." The feat was accomplished on 15 meters using Ten-Tec transceivers and Thales Communications Skywave 2000 digital audio software. Operating as F8KGG, Chulot spoke with Smith for several minutes over the HF digital link, operating within a 3-kHz bandwidth.

Smith said he and F5MJN used unmodified Ten-Tec transceivers in upper-sideband mode, although AM or FM mode also would work. No additional hardware was required beyond the cables connecting the transceiver and the microphone to the PC sound card. Smith said audio quality was roughly the same as a conventional telephone circuit. An Amateur Radio version of the Thales system is expected to appear on the market early next year. "At this stage, the system is experimental-only for ham radio, but it looks like it's going to take off," Smith predicted.

In terms of Amateur Radio, Alinco was the first manufacturer to come out with a digital voice option for

some of its transceivers. ICOM debuted its D-Star digital "concept radio" system last May at the Dayton Hamvention--where Smith chaired the Digital Voice Forum--and demonstrated it at the ARRL-TAPR Digital Communications Conference in September. The unit, which operates on 1.2 GHz, was scheduled to hit the ham radio market this fall.

Technical details of the Thales system will appear in an article "International Digital Audio Broadcasting Standards: Voice Coding and Amateur Radio Applications" in the January/February issue of QEX, which he edits. The article is available on the ARRL Web site <http://www.arrl.org/tis/info/pdf/x0301049.pdf>. He also has authored two articles on digital voice in QST: "Digital Voice: The Next New Mode?" <http://www.arrl.org/tis/info/pdf/0201028.pdf> in the January 2002 issue, and "Digital Voice: An Update and Forecast"
<http://www.arrl.org/tis/info/pdf/0202038.pdf> in the February 2002 issue.

Additional images and background are available on the TAPR Web site <http://www.tapr.org>. Look for the Digital Voice Forum page and the presentation by Cidric Demeure.--Ten-Tec news release; Doug Smith, KF6DX

NORTH KOREA ASKS P5/4L4FN TO QRT

The only Amateur Radio station active from North Korea has been ordered off the air. Ed Giorgadze, 4L4FN, had been operating for the past year as P5/4L4FN from Pyongyang. The ARRL subsequently accredited SSB and RTTY operation of P5/4L4FN for DXCC.

"This really hits the ham community hard," QSL manager Bruce Paige, KK5DO, said in a news release. "I, for one, was looking forward to a satellite contact on AO-40. I know that many of you were still awaiting your first QSO."

Paige said that on Friday, November 22, Giorgadze was called into a meeting with the "Radio Regulation Board" without any explanation, and he was politely asked to quit all transmissions and pack all his radio equipment. "Saturday, he spent all day on the roof disassembling his antennas and packing boxes." Paige said North Korean government officials later came by and sealed all of the boxes. When Giorgadze leaves North Korea on December 10 for two weeks of vacation, "he is to take everything with him out of the country," Paige indicated.

Giorgadze had tried for more than two years to obtain permission to operate Amateur Radio in North Korea and finally was given the okay in 2001 to bring an ICOM IC-706MkIIG into the country. In the intervening months, he's been slowly upgrading his antenna system. He's made more than 16,000 contacts during his stint in North Korea, and earlier this year attained the first DXCC ever from that country.

Paige said the P5/4L4FN logs should be 100% complete on his Web site < http://www.amsatnet.com/ > (click on "P5 North Korea").

Giorgadze, who's from of the Republic of Georgia, had been operating on the basis of oral permission from North Korean authorities, but ARRL Membership Services Manager Wayne Mills, N7NG, said the League was satisfied on the basis of written information submitted that the P5/4L4FN operation conformed with DXCC rules and cards would continue be accepted for credit.

FCC SEEKS PUBLIC COMMENTS ON SPECTRUM POLICY TASK FORCE REPORT

Public comments are due January 9, 2003, on the recently released report of the Spectrum Policy Task Force (ET Docket 02-135) <see http://www.arrl.org/news/stories/2002/11/07/103/>.
Reply comments are due February 10. The Task Force released its report to the FCC on November 15. The FCC notes that the Spectrum Policy Task Force Report was drafted by FCC staff and was neither voted upon nor approved by the Commission. "Accordingly, neither the Report nor any of the recommendations contained therein necessarily reflect the views of the Commission," the FCC added. The text of the Report and other Task Force documents are available on the Task Force Web site <http://www.fcc.gov/sptf/>. Parties are encouraged to file comments using the FCC's Electronic Comment Filing System (ECFS) <http://www.fcc.gov/e-file/ecfs.html>. Commenters should include full name, US Postal Service mailing address, and the docket number, ET Docket 02-135.

RS-20 IS NEWEST RUSSIAN AMATEUR RADIO SATELLITE PAYLOAD:

On November 28, the Russian Space Agency launched the Algerian AlSat-1 satellite along with a new Russian bird known as Mozhayets--a navigational and scientific
satellite. One of its experimental payloads is an Amateur Radio telemetry beacon that has been christened RS-20. Mozhayets orbits at an altitude of 720 km, completing a turn around Earth every 99 minutes. The Keplerian elements for RS-20 are: 1 27560U 02054B 02332.86497891 -.00019965 00000-0 -47472-2 0 37; 2 27560 98.2411 217.5728 0044302 75.5447

285.0613 14.53325574 86. RS-20 is transmitting CW telemetry on 145.818 and 435.319 MHz. According to information provided by Alexander Zaitzev, RW3DZ, each telemetry frame begins and ends with the beacon call sign, RS-20. E-mail reports are welcomed at plis@kaluga.ru.

AMATEURS AID IN WAKE OF CONNECTICUT ICE STORM

Amateur Radio Emergency Service (ARES) members got to work quickly the morning of Sunday, November 17, as an ice storm knoc ked out power to almost 130,000 Connecticut homes and businesses, mostly in the northwestern part of the state. The statewide alert--and the resulting ARES activation--lasted 48 hours. Connecticut Gov John Rowland toured the region and visited the ham station set up at the Torrington Emergency Operations Center.

Connecticut Section Emergency Coordinator Allen Pitts, W1AGP, said about 30 hams from all over The Nutmeg State headed into the affected area, mostly in northwestern Connecticut. He characterized ARES members' efforts as "wonderful." Pitts said Connecticut ARES had been drilling informally in conjunction with ARES teams in Eastern New York and New Hampshire, and the effort paid off. "The drills covered a very similar situation," he said. "The level of coordination and cooperation was incredible."

ARRL staffer Brennan Price, N4QX, was among those taking a turn as net control of the Connecticut Phone Net on 3965 kHz. "The good thing about this particular situation was with such a small part of the state hit, there were a lot of others in the state able to help out," he said. "It all came together quickly and was nicely pulled off."

West Hartford-Area EC Harry Abery, AB1ER, said most of the work hams did was in Torrington area shelters. That Litchfield County community was among the hardest hit.

Connecticut ARES linked 10 VHF and UHF repeaters in Torrington, Vernon, Naugatuck, Meriden, New Milford and Washington. Separate resource and tactical nets were run on other 2 meter repeaters.

Dutchess County, New York, EC Adam Nowik Jr, KC2DAA, said amateurs in Eastern New York activated their own net, and more than a half dozen New Yorkers arrived in the Torrington area within three hours of the activation. "Our net was kept active in the event the Connecticut section had need for additional communications or had a complete communications breakdown," Nowik said. Frank Stone, KB2YUR, served as a liaison between Abery and the hams in Eastern New York for the duration of the incident.

After 27 hours, the Connecticut Phone Net's Emergency session on HF was able to stand down the afternoon of November 18, as temperatures rose into the 40s. But 20 minutes later, the net was back up after a trunk line from
New York went down and more people lost power, Pitts said. Relief efforts by area radio amateurs continued into the evening of November 18, when the statewide ARES alert was terminated. "We did not shut down statewide until we were sure everyone was off the roads, home safe and checked in," Pitts said.

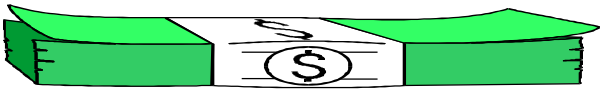
Pitts credited greater professionalism and proficiency over the past several months to the ARRL Amateur Radio Emergency Communications courses <http://www.arrl.org/cce/> offered on-line. "We're seeing a real difference, and the quality of operations is definitely up," he said. Thanks to a $33,000 grant from Hartford-based United Technologies Corporation, up to 250 Connecticut amateurs will be able to take the ARRL Level I Amateur Radio Emergency Communications course (EC-001) free of charge.

$November Treasurer Report$

Income for November was $20 from memberships, $91.50 net from the FoxFinder project, $12.50 from PowerPole connector distribution, and $23 from the book raffle at the meeting.

Expenses for November were $16.55 for newsletter and yearbook postage, $47.75 for the n1nc.org domain registration through July 2006, and $164.20 for another batch of 250 PowerPole connectors.

Net expense for November was $81.50.



Current balances:

General fund:	$4953.91
Community fund:	$1842.55

At the October meeting I was asked how much money the Club makes on PowerPole connector sales, so I'd like to remind everyone that the connectors are being priced below cost for NVARC members. The 250 connectors at $164.20 total with shipping will be sold to members for a total income of $125, leaving a net subsidy (expense) to the club of $39.20, or a little over 15 cents per connector. Because we are purchasing the connectors in large volume, we also are able to get a

much lower initial price than individual members would be able to get with smaller orders.

I would also like to remind members that the book raffle is run to be break-even; its sole purpose is to spice up the monthly meeting and give everyone present who wants to participate a chance to take something home. We purchase the books from ARRL at a discount and compute an average cost for each book. We then draw as many tickets at each meeting as the number of tickets sold divided by this average cost. We will always draw at least one ticket. Extra tickets bought above the average book cost are counted toward the next drawing.

73, -Ralph KD1SM

NVARC Swap Shoppe

Icom IC37A 220 FM transceiver (needs new volume control - intermittent/scratchy)

Larsen LM-MM MagMount and Larsen LM-220 220 Mobile Antenna

Following items are untested:
Mirage 220-250 C3012 amplifier, 30 watts in/120 out
14 element 220 beam with KLM 220-50 sleeve balun

$250 or fully MARS compatible 30 to 50 watt full-featured 2-meter FM transceiver

Tom, WA1RTD
Acton: 978-263-2382

Fleamarket Calendar

15 Feb Algonquin ARC, Marlborough, MA
20 Apr MIT, Cambridge, MA

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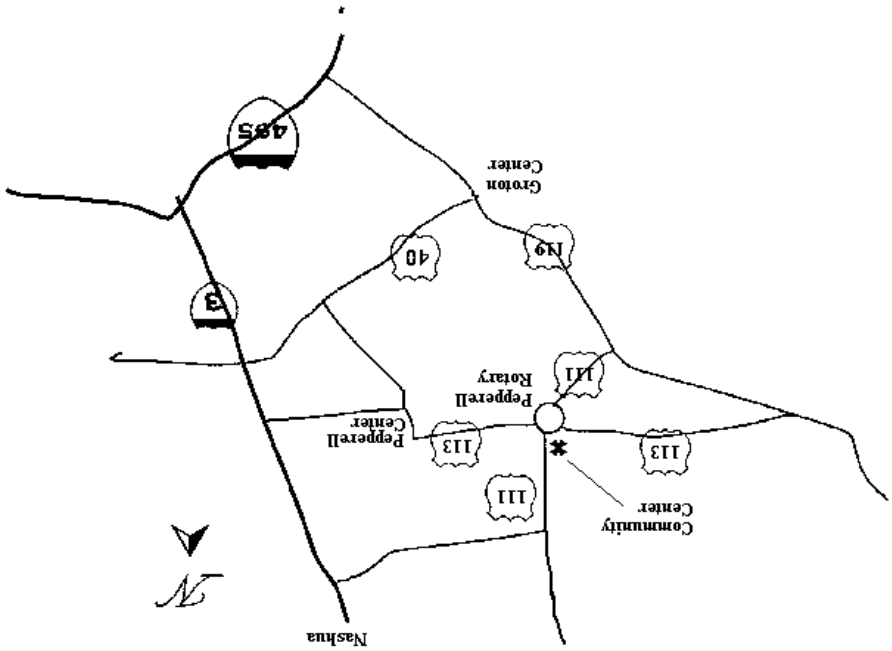
Pres.: Erik Piip KA1RV
V Pres.: Earl Russell WR1Y
Secretary: Ian Norrish NZ1B
Treasurer: Ralph Swick KD1SM
Board Members:
Den Connors 2000-2003
Bob Reif 2001-2004
Les Peters 2002-2005
Editor: Stan Pozerski KD1LE
Photographer: Ralph Swick KD1SM
PIO Ron Wood KB1GID
Librarian Peter Nordberg N1ZRG
N1NC Trustee: Bruce Blain K1BG
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



NVARC

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