NVARC
Nashoba Valley Amateur Radio Club

SIGNAL

SPECIAL SERVICE CLUB

January 1998 Volume 7 Number 1

NWS Open House Date Change

The National Weather Service Open House has been changed and has been officially moved to Saturday May 30th from 10 AM-5 PM, and Sunday May 31st from Noon-5 PM. This promises to be an even bigger affair than the previous two Open Houses with other groups such as MEMA, FEMA, the US Geological Survey and other groups being invited to participate in this Open House. This will be a great opportunity to spread out the word on ARES, RACES and SKYWARN throughout the entire Amateur Radio Community.

This Month's Meeting

This months speaker is Dennis Blanchard K1YPP. His presentation is A QRP Arctic DXpedition On A Motorcycle.

For February we plan to do the hands-on DSP theme with a number of DSP's to try out against various signals. You might want to read the FAQ on DSP in this month and next months newsletter to pick up some information on the subject.

Then for March Don KA1T will be here for a QSL card sort. Don is also the ARRL New England Vice Director. The League Directors meeting will be between now and then, so if you have any questions he may be able to answer them.

Gen, Adv, Extra Ham Classes

Tom WA1RHP is starting a General/Advanced/Extra class. The classes should start later this month. He plans to hold the class at the Shirley Library on Monday nights. For more information contact Tom Sefranik WA1RHP.

New Hams And Upgrades

New Hams and Upgrades? A couple of people missed one thing in the December 16th message - the license totals by Section and by license class only counted those who were getting a new license, and did not include information on people who have upgraded. The information below shows upgrade data but only for the last four months, I was not tracking it earlier.

For those looking for exam opportunities, remember the ARRL web site has an online list that includes a way to search for exam sessions within 20 50 or 100 miles of your QTH --> http://www.arrl.org/arrlvec/examsearch.phtml

New England Upgrades

	Aug-97	Sep-97	Oct-97	Nov-97	Total
CT	10	9	4	6	29
EMA	7	7	10	10	34
ME	9	6	9	14	38
NH	1	4	10		15
RI	1	3	1	5	10
VT	3	4	5	1	13
WMA	4	4	6	4	18

Upgrade to:

Tech+	13	12	17	17	59
General	7	13	13	8	41
Advanced	8	9	6	7	30
Extra	7	3	9	8	27
Total	35	37	45	40	157

You might wonder how the new license and upgrade numbers compare to the overall ham radio population in New England. A recent extract from the FCC database shows the following breakdown (by ARRL Section):

CT	8,509
EMA	10,905
ME	4,238
NH	4,754
RI	2,371
VT	2,143

WMA 3,743
Total 36,663

I hope the information on new licensees and upgrades is useful - it helps to track real numbers over time to see if trends can be identified. The information can probably be interpreted in several different ways, so don't hesitate to write or send a message to me (info at the bottom) or to Vice Director Don Haney, KA1T (ka1t@arrl.org) and let us know what you think.

ARRL New England Division News December 17, 1997 provided by Tom Frenaye K1KI ARRL New England Division Director

Very 73 – Tom

Last Month's Meeting

The December meeting was Homebrew Nite. We had presentations from William K1WD on a QRP rig he built, Earl WR1Y on a crystal radio he built and a power supply recovered from the Rochester scrap heap and modified, Craig N1ABY showed the finished Field Day power switch control box, Stan KD1LE showed a 2 meter amplifier built for Fox Hunting, and Bob W1XP showed the switching circuits and described the loop antenna system he built from an article in QST.

From The ARRL Letter

GATE 4 ATTRACTS HUNDREDS

The FCC does not expect to begin processing Gate 4 applications until after the first of the year. A spokesperson at the FCC's Gettysburg office said the current plan is to run the first-day applications on or about January 7, 1997, but emphasized that this is not a firm date.

The FCC has processed earlier vanity receipts through mid-November, including all work in process (WIPs) applications. In November, the FCC reports it got 517 electronic applications and 149 paper applications.

The FCC reports it got more than 800 electronic applications on December 2, the first day of Gate 4. Another 120 electronic applications showed up on December 3. A count of paper applications is not yet available.

AMSAT-NA SEEKS ADDITIONAL PHASE 3D DONATIONS

Conceding that it still needs another $270,000 to meet its share of the costs for the Phase 3D campaign, AMSAT-NA is once again soliciting donations to its Phase 3D Fund. A solicitation went out late last month over the signature of AMSAT-NA President Bill Tynan, W3XO. The letter expresses optimism that Phase 3D can be launched "before mid-1998, perhaps even within 6 months." AMSAT is asking its members to kick in another $100 each, if possible. "I think you will agree that this is a small price to pay for the many hours of pleasure we will all receive when Phase 3D becomes operational," Tynan's appeal says.

Phase 3D was to have been launched this year, but the Amateur Radio package was bumped from the Ariane 502 flight after it could not complete necessary structural modifications in time to meet the launch schedule. The changes became necessary at the eleventh hour after the European Space Agency imposed more stringent vibration and stress standards on Ariane 5 payloads. AMSAT is hoping to hitch a ride aboard another Ariane 5 flight in 1998.

Tynan points out in his letter that the additional time has been put to good use. Phase 3D now will offer two S-band transmitters, each with a separate antenna. The integration team also is looking at ways to ensure maintenance of proper temperatures within the spacecraft.

AMSAT-NA's Keith Baker, KB1SF, said recently that he doesn't expect a new launch date will be set until European space authorities pin down the cause of the problems during the recent Ariane 502 flight—the flight that was to have carried Phase 3D aloft. An early shutdown in one stage put the payloads into lower-than-expected orbits.

Contributions in any amount are welcome to AMSAT-NA Phase 3D Fund, 850 Sligo Ave, Suite 600, Silver Spring, MD 20910-4703. Contributions are tax deductible.

DXCC AND OTHER AWARDS ANNOUNCE NEW FEES

The ARRL DXCC Desk has announced new fees for DXCC, including a $10 fee for an initial DXCC application. This has been free for League mem-

bers. It will also cost more for walk-in card checking at conventions or at League Headquarters.

All applicable fees are charged on each application. Applicant must supply return postage or an SASE for any cards or information requests. The new fees go into effect January 1, 1998(view table in fixed font).

Current Fee	Item	New Fee
Free	initial application each year, member	$10
$10	additional application, member	$20
$10	initial application, foreign nonmember	$20
$20	additional application, foreign nonmem	$30
$2	convention/HQ walk-in card check	$5
10 cents	per additional QSO*	15 cents
$10	certificate fee (includes pin)	no change
$25+ship	Honor Roll & 5-Band DXCC plaques	$30+ship**
$40+ship	#1 Honor Roll plaque	$50+shipping**

*First application prices are for 120 QSOs maximum, and additional application prices are for 100 QSOs maximum. QSOs beyond those limits are charged at this price.

**includes pin

New fees also go into effect the first of the year for VUCC certificates and for WAS, Rag Chewers Club, Old Timers Club, Friendship, and WAC awards. An initial, replacement, or additional VUCC certificate will cost $10. Pins are $5. An initial WAS certificate will cost $5 plus return postage for your QSLs. WAS endorsements will be $3 plus return postage. The 5BWAS certificate will be $10 (includes pin) plus return postage, while the plaque will cost $30 plus shipping. The RCC and OTC awards will be $3 each while the Friendship Award will cost $5 (no charge for these awards from ARRL-affiliated clubs). The WAC and 5BWAC awards will be $3 for US applicants plus return postage for QSLs.

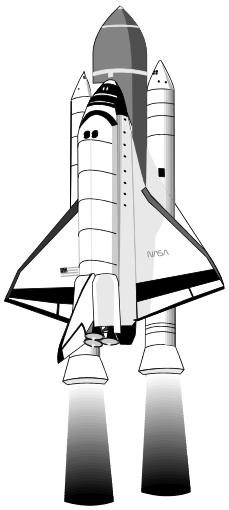
WASHINGTON POST: HAM RADIO REFUSES TO DIE

A recent Washington Post article lumped ham radio with mah-jongg, model rocketry, and something called squished penny (technically “elongated” coins) as “The Hobbies That Refused to Die.” The feature, in the paper’s Sunday edition, appeared November 14. The gist of the report was that there’s still room for ham radio and other “diehard” avocations in the age of “extreme sports and the Internet.”

The section on ham radio focuses on the reporter’s visit to Hamfest ‘97 in Gaithersburg, Maryland, sponsored by the Foundation for Amateur Radio, and mentions the article on ham radio that appeared earlier this year in Forbes magazine. The reporter, Dave Nuttycombe, touches on such ham activities as traffic handling, using H-Ts, and restoring older tube-type equipment. He also quotes several hams, including Jim Parsons, WA4LTO, and Geoff Adams, N3QFX, and there’s a picture of Parsons at a ham station. Parsons told the reporter that part of ham radio’s appeal to him is the challenge that’s lacking on the Internet.

Some hams would balk at the article’s overall premise that ham radio (he calls it simply “ham”) is among the hobbies that have fallen out of fashion and are “now carried on by a valiant few.” But Parsons—a graduate of Virginia Tech and an alumnus of its K4KDJ club station—said this week that the article sparked a bit of interest in the DC area. “Reaction has been great. We’ve gotten a few calls,” he said.

The article mentions The Vienna Wireless Society, the Mount Vernon Amateur Radio Club and the Columbia Amateur Radio Association as contact points and gives a plug to Auto Call, the official journal of the Foundation for Amateur Radio. The circulation of the Washington Post Sunday edition is more than 1.1 million.



KC5VPF gets extra time aboard Mir: NASA has delayed next month’s space shuttle flight to Mir, leaving American astronaut David Wolf, KC5VPF, aboard for at least another few days. The shuttle Endeavour was supposed to blast off January 15, but NASA announced Monday that the new launch date will be January 20. Wolf, who’s been on Mir since late September, learned of the delay last weekend. The delay will give the Russian crew time to do additional work on Mir, including three spacewalks and the arrival of another

supply ship. NASA also wants to check out problems discovered on the shuttle Columbia which returned to Earth last week after a two-week mission. Also, one of Endeavour's cargo bay doors accidentally was dented last week. The Endeavour will pick up Wolf and drop off his replacement, Andy Thomas, KD5CHF. Thomas will be the last US astronaut to live aboard Mir.

HAM RADIO TO THE RESCUE—AGAIN!

Three Franklin Pierce College students may owe their lives to ham radio. The three found themselves stranded on New Hampshire's Mount Monadnock in late November after becoming disoriented and lost in the snow and darkness. Fortunately, one of the students was Michael Sensabaugh, KB2SSA, of New York. He radioed for help with his small hand-held transceiver via the K1TQY repeater in Keene.

Repeater trustee Dawn Cummings, K1TQY, and Roberta Bennett, N1WTY, responded. Cummings took charge of communication. Bennett called in the alarm to Monadnock State Park Manager Michael Walsh. Then, she bundled her young son and her own H-T in the family car and drove to Walsh's office. Throughout the next four hours, Bennett provided a radio link between the lost students and the search party via "Henry, the Keene Machine," as the K1TQY repeater is known. Walsh was thus aware of the students' current predicament and was able to instruct and encourage them accordingly. The students were found late that evening and brought to safety as bad weather continued to move in.—thanks to Richard Seifert, KB2FF

FCC FORMS CONTRACTOR NOW HAS NEW FORM 610

With just days to spare, the new FCC Form 610 now is available from the FCC's forms contractor. The FCC has ordered the destruction of all previous versions of the form. As of January 1, 1998, the FCC will accept only the new Form 610 for all filings. Forms 610A and 610B also have been amended. The major change in the new Form 610 is a certification that says the applicant has read and will comply with the new RF radiation safety rules that begin phasing in on January 1, 1998.

The FCC Forms Distribution Center accepts orders at 800-418-3676.

That's not to say the new Form 610 simply has not been available until now. ARRL VEC Manager Bart Jahnke, W9JJ, says the ARRL/VEC sent out 43,000 copies of the revised 610 last week to VE teams across the country. The ARRL had copies printed earlier this fall and has been supplying the new forms to those who have requested them for the past six weeks. In addition, the ARRL now supplies a new handout, Additional Information for Amateurs Completing the New FCC Form 610, that contains a condensed version of how to comply with the new RF safety regulations.

The new Forms 610 also have been available from the FCC's Web site at http://www.fcc.gov/formpage.html, at ftp://ftp.fcc.gov/pub/Forms, or by fax at 202-418-0177 (request index).

To order a new Form 610 from the ARRL, send a self-addressed, stamped envelope to ARRL/VEC, 225 Main St, Newington, CT 06111. Include one unit of first-class postage for each Form you order.

OHIO VOA ANTENNAS COME DOWN

Ham visitors to Ohio—perhaps on their way to the Dayton Hamvention—sometimes found it hard to keep their eyes on the highway when passing the Voice of America's Bethany Relay Station. The vast antenna farm off I-75 north of Cincinnati consisting of 14 rhombics and a huge Sterba curtain easily distracted most hams.

At one time among the most powerful shortwave stations in the world, the Bethany Relay Station was shut down a couple of years ago. Earlier this month, the towers supporting the majestic Sterba curtain and other wire arrays came crashing down—to make way for commercial and recreational development and a university campus on the 625-acre site. Among those on hand to watch the spectacle was Tom Rupp, W8TCR, a VOA engineer for 26 years who retired in 1993.

Work will continue to remove the other towers and structures. Most of the towers will be pulled from the ground with a crane. Forty towers, ranging from 90 to 150 feet tall, will be salvaged. Crews will finish clearing the towers by February.

A report in the Cincinnati Enquirer quoted ham radio operator Joe Goforth, WB8NFJ, who lived less than a mile from the VOA site for two decades. "I used to talk to the engineers all the time," he told the paper, noting that VOA broadcasts sometimes interfered with his ham gear. "But I guess I'm a little disappointed to see it go," he added.

For a look at one of the Sterba curtain support towers coming down, see http://www.palmtop.net/img/voa.jpg. For more info on the Bethany Relay Station, visit the Jim Hawkins' (WA2WHV) Radio Room,

http://www.exit109.com/~jimh/voaohio.html.--thanks to Mitch Hamm, N8XS, and Jim Hawkins, WA2WHV

QEX TO GO BIMONTHLY

QEX, the ARRL Forum for Communications Experimenters, will become a bimonthly publication starting in January, and the magazine will expand in size to compensate for the new publication schedule. “Two months is not so long that you forget we are here, and the amount of material is not so great that you can’t take the time to read through it,” said new QEX Editor Rudy Severns, N6LF. Severns said the total amount of material subscribers get each year would not decrease. “Issues will be either 48 or 64 pages, depending on the available material,” he said. Several interesting articles are set to appear in the January/February issue. Among them is “The Car—As a Contoured Ground-Plane,” a discussion by Peter Madie, KE6RBV, that will appeal to mobile operators trying to determine the best place to locate their antennas. In the same issue are “Parabolic Dish Feeds—Performance Analysis,” by Paul Wade, N1BWT, plans for a 2.4 GHz Phase 3D receiver by John Reed, W6IOJ, and a tutorial, “RF Phase Shifters for Phasing-Type SSB Rigs,” by Byron E. Blanchard, N1EKV. Also, Randy Henderson, WI5W, explains how to build an economical high-voltage power supply. The regular “RF” column by Zack Lau, W1VT, and subscribers’ letters round out this issue.

The basic QEX subscription rate will increase slightly. Effective January 1, ARRL members will pay $18 per year (six issues); nonmembers will pay $30. “These two changes will help ensure QEX’s long-term financial health,” Severns said. For more information, or to subscribe to QEX, visit the ARRLWeb site, http://www.arrl.org/ or call toll-free 888-277-5289.

NORTH POLE NET

Thanks to ham radio, several hospitalized kids in the Omaha area got a chance to visit with Santa Claus earlier this month. Sixteen members of the Ak-Sar-Ben Amateur Radio Club were called into action by Santa to activate the North Pole Network on December 13. This marked the fourth consecutive year that net coordinator Pat Joseph, N0HPP, has organized the event that uses ATV and Amateur Radio to allow Santa Claus to visit area hospitals. Working with Santa and the nurses and technical staff of area hospitals, the children could see and hear Santa on their hospital room TVs and talk to him via Amateur Radio. This year, three hospitals had children who wanted to talk to Santa, and 24 kids had a chance to have a visit from Santa and discuss their Christmas lists. The hams used the K0USA 2-meter repeater, which is owned and operated by the Ak-Sar-Ben ARC, and the WB0CMC ATV repeater which is sponsored by WOWT Television. Both repeaters are located on the WOWT broadcast tower.—Pat Joseph, N0HPP

HAM RADIO HISTORY

In a whimsical mood, here’s a lighthearted look at ham radio history. The original version of this was posted on the Contest Reflector a few months back.

4 Billion BC—Earth is a swirling ball of flames. Propagation is extremely poor.

1 Billion BC—First dry land appears. It is divided up into grid squares.

500 Million BC—Second patch of dry land appears. First DXpedition; DXCC credit disallowed because of questionable licensing agreement.

400 Million BC—Flowering plants and grasses evolve. Rotary beam invented, but sales stall for lack of suitable mounting structures.

300 Million BC—First tree appears and is immediately cut down, stripped of branches, placed in a concrete base and called a telephone pole. Beam sales pick up.

200 Million BC—More beams sold. Installer falls from top of pole. Safety belt is invented.

100 Million BC—First mountain appears. The repeater is invented.

50 Million BC—CQ is adopted.

4 Million BC—Humans replace swine as dominant species. The name ham operator hangs on, however.

3 Million BC—Dugout canoe invented. Maritime Mobile Net formed on 14.313 MHz.

2 Million BC to 800 AD—Nothing much happens for a long time.

900 AD—Chinese invent gunpowder. BY1AA is first “Big Gun” DXer.

1790 AD—Ben Franklin invents long wire receiving antenna. Ground switch invented.

1961 AD—Second repeater erected. First repeater group refuses to change frequency. First repeater coordinator appointed.

1997 AD—Amateur Radio humor sinks to a new low.

DXCC FEE HIKE EXPLAINED

New fees for the DXCC program that went into effect January 1 will only cover about one half of the program's substantial annual shortfall. The DXCC program costs at least $100,000 more each year to administer than it collects in user fees, despite greater efficiency and a smaller staff than in the past. That explanation from ARRL Executive Vice President David Sumner, K1ZZ, came in the wake of comments from DXCC participants who were unhappy about the fee increases.

Sumner noted that the League "had a difficult financial year in 1996," when it posted a $700,000 operating loss. To turn things around, Sumner said, the Board of Directors determined to curb continuing losses as well as cut other costs and seek additional income sources. In the case of DXCC and other membership service programs that serve a portion of the membership, these efforts focused on ways to reduce costs or to make the programs more self-sustaining through user fees.

"The DXCC program is expensive to administer in its present form," Sumner said, pointing out that the League plans to take advantage of new technology in an effort to further cut the program's costs without affecting its integrity. New software scheduled to come on-line early this year should increase the speed of DXCC processing. "After that, attention will turn to a program that will allow members to file DXCC applications electronically, which we anticipate will lead to further savings without sacrificing integrity in any way," he said.

"Everyone wants the DXCC program to continue and to provide the kind of service that members deserve." Sumner emphasized that the League "never considered as an option" any steps that might have affected the integrity of the DXCC program.

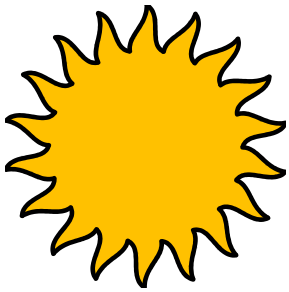
SPUTNIK PS2 DEAD?

Reports from around the world appear to confirm that the Sputnik PS2 mini-satellite has stopped transmitting. The beacon signal from the working model of the original Sputnik 1 satellite was last monitored on December 29 or 30. The lithium battery-powered 200 mW transmitter had continued working for eight weeks after its launch by hand from the Russian Mir space station on November 3, transmitting a beep-beep tone on 145.82 MHz, and many hams around the globe had continued to track the satellite's progress. The frequency of the tone indicated the satellite's internal temperature. Recent reports from stations monitoring the Sputnik PS2 indicated its signals were getting weaker.

Students from the FR5KJ radio club at Jules Reydellet College in St Denis, Reunion Island, and at the Polytechnic Laboratory of Nalchik Kabardine in Russia cooperated in building the mini-Sputnik. The Russian students built the satellite body, while the French students fabricated the transmitter inside. Two working models of the Sputnik were assembled and transported to Mir, but only one was launched. The Sputnik PS2, also called RS-17, surpassed the life of its original namesake by several weeks. The little satellite was a one-third scale model of the original and had been estimated to remain in operation for approximately 40 days.

As of January 2, the satellite had not been officially declared dead, however.

SOLAR UPDATE



Solar sage Tad Cook, K7VVV, Seattle, Washington, reports: Conditions were good for the last week of the year with higher solar activity than the previous week and mostly low geomagnetic activity. The exception was on December 30, when the global K index went as high as six and the global A index was 25. This was due to a coronal mass ejection on December 26 as well as a coronal hole. On the last day of the year, the average solar flux for the previous 90 days rose from 94 to 95, and the solar flux was above that level each day of the week.

Average solar flux has steadily risen over this year, particularly in the second half. Average solar flux for the first quarter of 1997 was 73.8, and 73.6 for the second, 82 for the third and 94.3 for the fourth quarter. Look for steadily rising figures in 1998. (The reason that 94.3 for the last quarter is not the same as the 95 average for the previous 90 days is that the last quarter includes October through December--actually 92 days. The 95 number mentioned in the previous paragraph is rounded up, and the difference in averages is only .18.)

For the short term, we should have fair conditions for the ARRL RTTY Roundup this weekend. No predicted geomagnetic disturbances are predicted, and the solar flux for January 2-4 is forecast at 98, 93 and 90. The latest projection shows the solar flux going down to the mid to high 80s, then back

above 90 around January 16, and above 100 after January 21.

Sunspot numbers for December 18 through 24 were 35, 16, 27, 30, 41, 72 and 67 with a mean of 41.1. The 10.7-cm flux was 86.2, 87.7, 89.6, 92, 97, 104.1 and 107.8, with a mean of 94.9, and estimated planetary A indices were 6, 2, 2, 3, 2, 3, and 3, with a mean of 3.

Sunspot numbers for December 25 through 31 were 56, 50, 56, 55, 79, 56 and 64 with a mean of 59.4. The 10.7-cm flux was 104.7, 104.7, 95.9, 102.1, 104.4, 101.3 and 104.5, with a mean of 102.5, and estimated planetary A indices were 2, 1, 2, 2, 3, 25, and 4, with a mean of 5.6.

DSP FAQ's

What is DSP?

DSP is the processing of a signal which has been converted from analog form to digital form using a digital computer and algorithms to simulate various filtering schemes.

What major functions does a DSP system perform?

The DSP must convert the analog signal to digital, process it, and possibly convert it back to analog (depending on the application). It must therefore have an analog to digital converter (ADC), the DSP processor, and a digital to analog converter (DAC).

What functions might a typical DSP System contain?

Input low pass filter (Anti-Aliasing filter)

Analog to Digital Converter (ADC)

Digital computer or Digital Signal Processor

Digital to Analog converter (DAC)

Output low pass filter (Anti-Imaging filter)

Why does the DSP system have an input filter?

The analog input signal is filtered by an input low-pass filter. This is to allow only the component that the sample rate of the DSP can handle (anti-aliasing filter).

Why does a DSP system have an output filter?

When the digital signal is converted back to analog by the DAC the waveform is stepped. The output filter smoothes the waveform (anti-imaging filter).

Why use DSP?

There are certain advantages for using DSP to process analog signals:

Since the process is controlled by a program a DSP implementation is more flexible. Its operation can be modified by changing parameters while in operation and software can be upgraded to improve its operation without changing hardware.

DSP provides better signal quality and more repeatable performance because the characteristics of the system are represented in digital forms.

Some signal processing functions can only be implemented digitally. Some examples are lossless compression, linear phase filters.

See next months newsletter for the second installment of the DSP FAQ's and be ready for the meeting.

Board Meeting

The Board Meeting was held January 8th and the following subjects were discussed.

The schedule of presentations for the next three meetings. They are listed under "This Months Meeting" heading.

The status of contacting new area hams and newsletter and welcome letters.

Elections are coming up in April and we need some new candidates for all the offices.

Groton Road Race is scheduled for Sunday April 28th, so Erik will be looking for volunteers.

Larry Buck looking for clubs to man the Ham Booth at the Big E in the Fall. Hams who work the booth get free passes to the fair.

This coming weekend (January 10th) is the ARRL New England Cabinet Meeting hosted by Director Tom Frenaye K1KI. That will be reported at the club meeting.

We received our renewal for Special Service Club and that paperwork is being submitted by Stu K1YET.

ARRL Cabinet Meeting

As noted above, I attended the Cabinet Meeting on Jan 10th at Devens accompanied be Wolfgang KA1VOU. Many topics were covered and I will write up my notes to give an update at the meeting. The following are some of the issues covered.

Don Haney KA1T leaving the area.
New Ham licenses about even with expirations and SK's.
Of the 20 or so Amateur Bands (by my count) only 3 are not listed somewhere under proposals for changes in the US or Internationally.
26 clubs participating in GOTAP.
Boxboro 98 Aug 28-30.
N1ZZZ issued in December.
Proposals to restrict usage of Medical Waivers.
New VE's cannot administer tests they didn't pass (ie waivers).

Stan KD1LE

NVARC Trading Post

Dave N1MNX has some items available for the asking; 110 VAC to 18 VAC transformers and a Power Supply with an output of 5 V at 45 A, 12 V at 6 A, and -12 V at 6 A.

NVARC QSL Bureau

Bring your cards and a QST label to the meeting or to breakfast and the club will take care of the shipping and bureau fee.

$The Treasurer's Report $

No report available at time of printing. Your club membership expiration date will not have been updated if you paid recently.

CW Practice Nets

The NVARC slow speed net meets Tuesday and Thursday at 7:30 p.m. on 28.123 MHz. Except the third Thursday of the month. That being the club meeting night.

Say What?

My interest is in the future - Because I'm going to spend the rest of my life there.

C. Ketterig

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PIO: Earl Russell WR1Y
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442.90 + 100Hz Repeater
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