



NVARC

Signal



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Next Meeting

January's meeting will be held 7:30 PM on January 16 2025 at the Pepperell Community Center at 4 Hollis Street in Pepperell Massachusetts.

Topic for the evening will be "Short Subjects", the annual tribute to our attention spans.

Weekly 2-meter Net

The NVARC Information Net is held Monday nights at 7:30PM local time on the 2m N1MNX repeater – 147.345MHz+100pL.

President's Corner Bruce K1BG

I hope everyone had a safe and enjoyable new year.

As I mentioned last month, radio propagation conditions are the best that we have seen in decades. There is a lot going on "on-the-air". The on-the-air experiences are the things we remember most in our enjoyment of radio. The places we've been, the people we've met, the magic of radio that makes this all possible. Right from your kitchen table or other convenient location.

Our new and newer hams are experiencing this thrill for the first time, and I'm hearing from a lot of them! Last month I introduced six new hams, and Dave Wilson, KC1VYF, becomes the seventh new ham to join our ranks. These hams have been participating in our weekly Monday night 2 meter nets, and we've added a 10 meter gathering after the net is over for everyone that can't get into the repeater. Please join us next week (or any week) for both. Monday at 7:30 PM on the N1MNX Pepperell Repeater, and on 28.410 MHz when the net is over.

Speaking of the repeater - over recent years, Jim, N9VIM, has worked on improving the N1MNX repeaters which the club uses for our weekly nets and local communications. While NVARC is NOT a repeater club and we don't own the repeaters, the N1MNX repeaters ARE our local repeaters. Recently, Matt, KC1TUV, and Lee, N3LEE, have been helping Jim with his efforts. The three of them make quite an impressive team.

The N1MNX repeaters consisted of amateur multiband FM transceivers that were stitched together to function as a repeater. Over the last year or so, three of the repeaters on the site - the 2 meter repeater, the 70cm repeater, and most recently the 6 meter repeater - have been replaced with Midland Base Tech II commercial rack mounted repeaters (the 6 meter repeater is not yet in service, but it is being prepared). The acquisition of (relatively) modern repeaters offers all kinds of opportunities for the repeaters, not only in terms of reliability but in terms of functionality. I know that there have been discussions about improving the antennas and feedlines, painting the shelter, and other improvements to the N1MNX repeater. But all of this needs the support of the local amateur community.

You can help in two ways. First, a donation to the effort would be appreciated. The improvements so far have come out of the pockets of the three individuals I mentioned above. Second, your time. You won't have to climb a tower or haul heavy gear. If you can help with painting the shelter when the warmer weather comes, that would be huge. In any event, my message is - please help with the effort. Contact Jim, N8VIM, and let him know.

Jim, N8VIM, is also still looking for someone to help him with the recording of club meetings for the YouTube channel. Contact him if you would like to volunteer.

January is "Short Subjects Month" at the NVARC meeting. Club members and guests are offered the opportunity to stand up and talk on any subject that they would like. I will speak on something that I've been asked about by several of the newer hams from the recent Tech Class. Come and join the fun.

I'd also like to remind the membership that a group of club members meet at Tiny's Restaurant in Ayer every Saturday morning starting at 7:30 AM (food orders go in at 8 AM sharp). Everyone is welcome to join us.

That's it! See you at the January meeting.

Treasurer's Report Ralph KD1SM

Income for December was \$60 in membership fees. Expenses were \$0.45 in PayPal fees leaving a net income of \$59.55 for the period.

Current balances:

General fund \$3,299.92

Community fund \$7,128.25

Special welcome to two new members: Zack KC1VUY and Mary KC1VSQ. Both sent their applications in December.

As of 9 January we have 56 members who are current with their dues and 34 renewals outstanding. Renewal months are in the member list on www.n1nc.org in the Member's area; check yours on <https://www.n1nc.org/Members/Roster> or you may also email me.

A Special thank you to those of you who mail your renewals or use PayPal without a reminder. To pay membership dues via PayPal see the instructions in the same Members area.

If you are joining ARRL or renewing your membership please note ARRL's instructions to enter your NVARC membership information. As an Special Service Club, the ARRL expects a majority of Club members to also be ARRL members and will send a portion of your new or renewal ARRL membership fee back to the Club. Contact Ralph for further information if you need it.

Board Meeting Report John K1JEB

The new 21st Century NVARC Web Page is currently being constructed in coordination between Eliot W1MJ and Ralph KD1SM.

Jim N8VIM is adding new guest speaker videos to the NVARC YouTube site.

This month's Club meeting will be Short Subjects Night.

Les N1SV is coordinating with Gerry W1VE for February's Club meeting presentation on Remote Station Control.

Lately there has been an increase in hams checking in to the 7:30pm Monday 2-meter Information net.

There is also an active informal group meeting of newly licensed technician class hams and older hams on the 10-meter band on 28.410Mhz at 8pm on Monday nights right after the 2-meter NET.

The 2-meter repeater is working well thanks to Jim N8VIM. Work is in progress to improve the 440 repeater and revamp the 6-meter repeater.

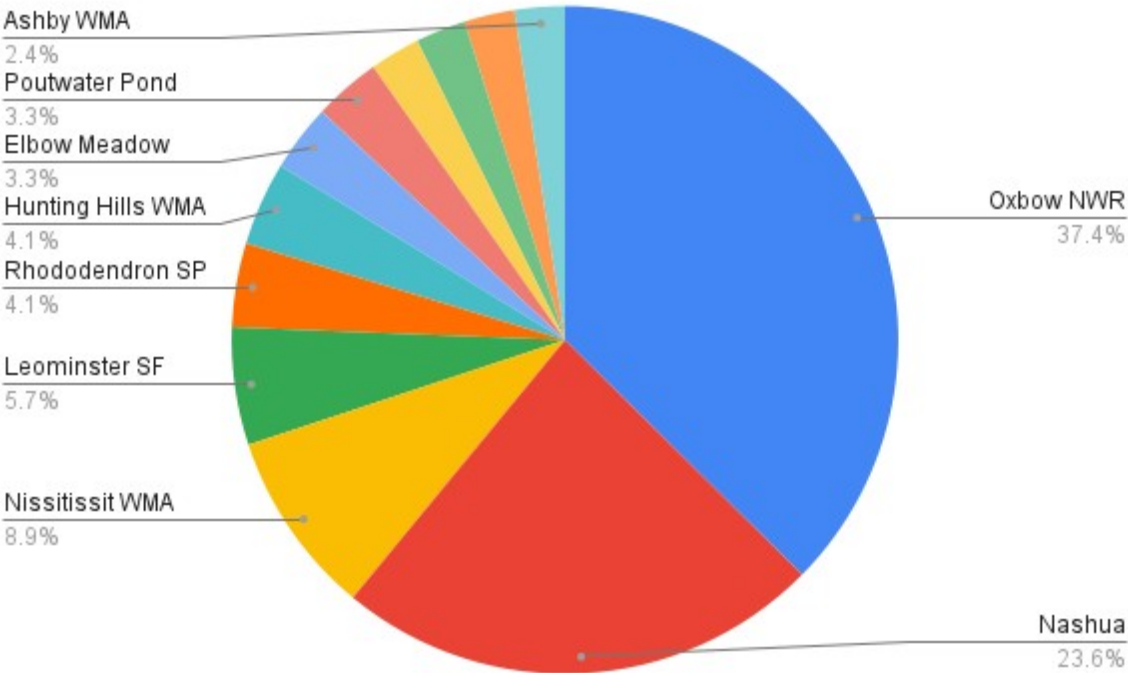
The board passed a vote to give one year free NVARC membership to those that completed the NVARC technician class and passed their Technician license exam .

2024 POTA Wrapup
John KK1X

Not one for New Year's Resolutions (not that I couldn't do with some improvement, but I lack follow-through...), I did manage to set what I thought was a ridiculous goal for 2024. I set out to make at least 500 Parks On The Air (POTA) Activator contacts each month, and managed to beat that quite handily, with a cumulative total of 7744 logged POTA QSOs.

In order to achieve these 6,000 proposed contacts, I knew I'd have to be out in the field a lot. Fortunately, in May or June of 2024, the POTA organization designated a large number of Massachusetts Wildlife Management Areas (WMAs) as valid POTA locations, so overall there was a lot of variety in places I was able to operate. I managed to sneak in activations in all six New England states, as well as Pennsylvania on a trip to West Virginia.

From the logs, it would appear I submitted 253 logs, 32 of which were "two-fer" locations, where parks overlap (mere intersections don't count). This still allowed for some 220 outings, some of which came three or four to a day. When the WMAs were released as POTA sites in the early summer, there was a (relatively) huge scramble to get out and claim these areas as "All Time New One" parks, earning bragging rights for the operator who first activates said park. Quite a few of my logs were short - eleven or twelve contacts - just to make the ATNO activation, decamp, then off to another park. Over the course of the year, I visited 108 distinct locations, most only once, but a number of them are conveniently located near Ayer and were visited repeatedly.



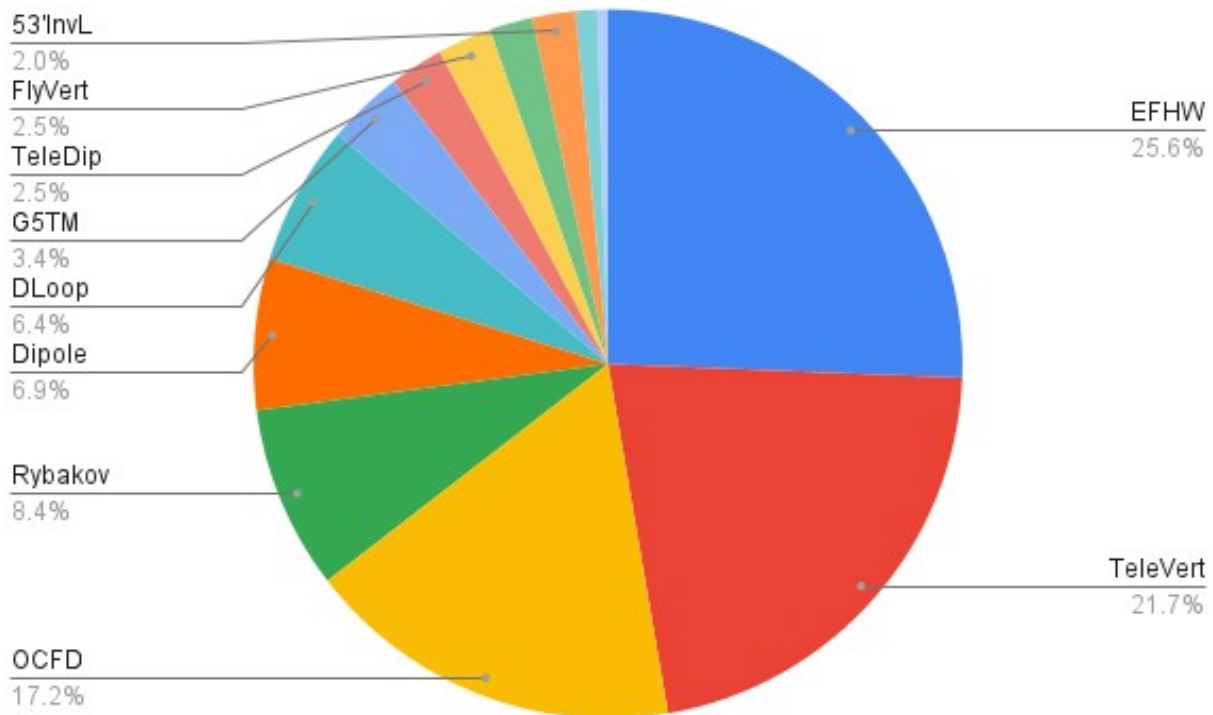
Most of the time, especially in the Wildlife Management Areas, I'll encounter only one or two others, typically hikers, hunters, or anglers. Occasionally the police show up, sometimes at the request of a "concerned citizen". Once, as I sat in a WMA parking spot west of Greenfield, a local resident came by on horseback and asked what I was doing? Was I supposed to be there? Doing *that*? Sure enough, 20 minutes later a local LEO rolls up and eyeballs the operation. He walked away with a pamphlet I had printed about POTA "to share with his fellow officers". In another "incident" a busybody sent the cops, but that officer recognized me from the Groton Road Race. I think he got a pamphlet, too. I was absolutely roused at the peak of Mount Wachusett by a park employee who informed me that I'd need a permit to operate, as well as a million dollars' worth of liability insurance. I didn't want to operate there *that* much. Something told me she didn't care about pamphlets. She didn't get one!

2024 POTA Wrapup

On the other hand, I do try to check in with park staff if they're available. Pamphlets go a long way there, too. I find that park staff are usually quite welcoming, some telling me where other hams operate (hint, hint). It might well be their first encounter with amateur radio, and even I try to remain nice. One young lady (I suspect a summer intern, in Pennsylvania) was just delighted that I had pamphlets about what I was doing. I do think she was easily impressed...

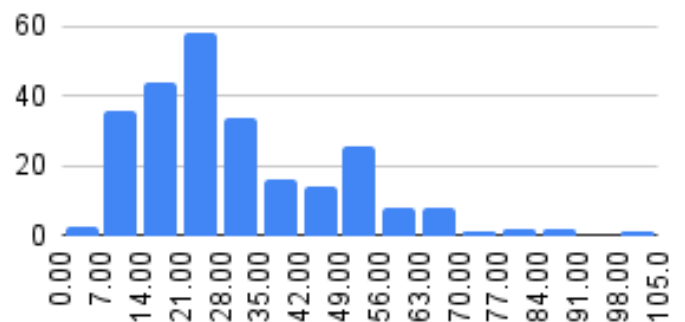
A relatively large number of contacts were made at the Oxbow NWR. The Bill Ashe Visitor Center on Devens is very handy for me, both in location and amenities. They maintain a portaLet, which is a rare hint of civilization. Also, a grass median in the parking area is about 35 meters (115 feet) long, enough to host any antenna I'm testing. It's not a great test site as it's blocked on the east side, but it's consistent. The Oxbow also shows up in a number of "two-fer" contacts. The Oxbow NWR overlaps the Nashua-Squannacook-Nissitissit Scenic Waterway in a few spots, and I spent more than a few outings here just building up contacts in slow months...

I've tested a number of antennas this year, and found that I pretty much liked the End Fed Half Wave (EFHW - that antenna that everybody says can't work), a quarter-wave telescoping vertical (i.e. MFJ-1979, now crafted from unobtainium), and the Off Center Fed Dipole (OCFD). The Rybakov, dipoles, and the delta loop also played well for me.



I was asked a few years ago how long I stayed in a park to activate, or how many contacts I made in a typical activation. For those activations in which I was merely trying to get the park logged, I'd stay for eleven or twelve contacts, to ensure that I beat the minimum ten contacts constituting an activation. More generally, I'd stay out for an hour or two. The histogram (right) shows that the bulk of my outings resulted in between fifteen and thirty contacts, which would take about an hour in general, longer if I wasn't able to access the internet with my phone to spot myself.

Histogram



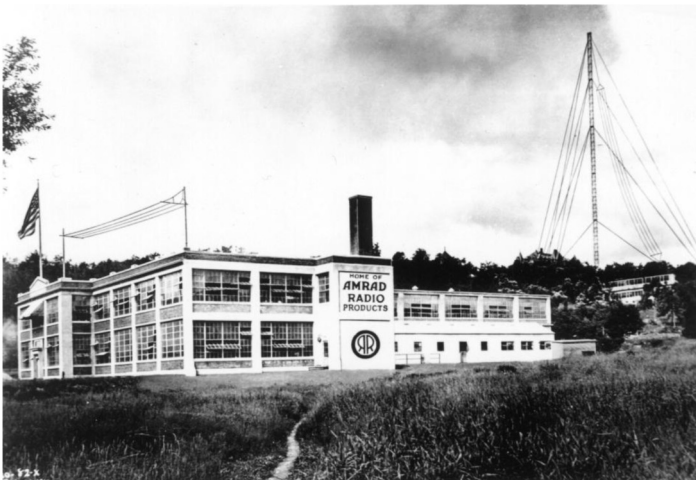
American Radio and Research Corporation Leo K1LK

The American Radio and Research Corporation was known as AMRAD. It was an idea from new engineering graduate Harold J Power (1893-1969), who graduated from Tufts University, Medford Mass in the Class of 1914. His interest in radio started early. Powers built an amateur radio station at the age of 12 at his home in Everett Mass. He was first licensed in 1907, call unknown.

Two of his professors were impressed with his aptitude in the science of radio theory and design. They obtained land and a small building on Tufts property. With help from other graduate students with little or no pay, they designed a low power station. In 1917 it was issued 1XE call with the designation experimental commercial license.

Backing from JP Morgan Jr permitted a large research lab to be constructed, where amateur and commercial equipment was designed until war broke out in 1918. They supplied radio receivers at that time to the Army. The first advertisement for amateur radio gear was placed in the October 1919 issue of QST. In 1918 a woman named Eunice Randall (1898-1982) was hired. Eunice was a licensed amateur radio operator (1CDP, later W1MPP). She wore many hats at 1XE. Eunice had the knowledge to run and repair any breakdowns. A well known ham Irv Vermilya 1ZE (W1ZE) mentored her on the finer parts of radio. Irv wrote a tribute to Eunice in the July 1921 QST. Experimental station 1XE transitioned to commercial station WGI [[https://en.wikipedia.org/wiki/WGI_\(radio_station\)](https://en.wikipedia.org/wiki/WGI_(radio_station))], which had no sponsor revenue until Eunice started reading bedtime stories with a paid sponsor. Morgan was not realizing any returns on his investment in WGI and pulled out. Start of the end when there were breakdowns no one had any money for repairs.

In April 1925 WGI ceased broadcasting. Many other more powerful stations were broadcasting in the Boston area. Harold Power was still trying to keep AMRAD afloat. Unfortunately AMRAD had become synonymous with delays and missed opportunities. In late 1925 with no backers Crosley radio purchased the company. It manufactured radios under the AMRAD name until 1930 when it dropped the name.



AMRAD 1XE in Medford Hills MA



Eunice
Randall
at 1XE,
1921

AMRAD
The Recognized Symbol of Superior Performance

The Ideal D. C. Supply

AMRAD "S" TUBE 3000 is finding increasing favor with relay men as a reliable and efficient rectifier of high voltage alternating current. It requires no filament heating current and is therefore exceptionally long lived—3000 hours and upwards can be expected.

"S" TUBE 3000 passes sufficient current to operate two five-watt power tubes and for this purpose the Tube is expressly designed.

A high voltage supply consisting of two AMRAD "S" TUBES 3000 and AMRAD MERSHON ELECTROLYTIC CONDENSERS is ideal for 10 watt C.W. or telephone transmitters. "S" Tubes, being free from "back leak," and Mershon Condensers, providing a capacity of 30 mfd. each, insure freedom from annoying hum or growl.

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Bulletin E sent free on request describes both the AMRAD "S" TUBE RECTIFIER and MERSHON ELECTROLYTIC CONDENSER and gives wiring diagrams. Complete Amrad Catalog 10 cents in stamps.

AMRAD "S" TUBE RECTIFIER No. 3000
Rating—20 watts
Voltage 300 - 750 v.
Capacity 50 M.A.
Price—\$8.00

AMRAD M.E. CONDENSER No. 2747
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11/15/2024 — ARRL® The National Association for Amateur Radio® announces the results of the 2024 ARRL Division elections. In the ARRL New England Division, Tom Frenaye, K1KI (1,593 votes), of West Suffeld, Connecticut, was declared the winner, defeating current Director Fred Kemmerer, AB1OC (1,452 votes).

Frenaye has previously served on the ARRL Board of Directors in several capacities, including as Director from 1985 – 1992 and from 1997 – 2018. He was named Director Emeritus in 2019. He served as ARRL Vice President from 1992 – 1996.

AMRAD Variometer

Outgoing DX QSL Service

One of the benefits of being a NVARC member is that the club will forward DX QSL cards to the ARRL Outgoing Buro at club expense. Cards should be sorted by DXCC listing and proof of ARRL membership (e.g. QST mailing label) is required. Interest members should bring card to a meeting and give them to Rod, WA1TAC.



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Antenna Corner John KK1X



Not much has been going on in the Antenna Corner this month. I tried a couple variations on what I'm calling the "Flying Vertical", which is merely a dipole with one leg going vertically and the other sticking off to the side. One day I sat out in a park for three hours and made 77 contacts on 10 meters. It also works well on 20 meters, the only other band for which I've "built" an antenna. The "build" part is cutting two wires to length after forming a loop at one end, and crimping a fork connector to the other end. A BNC binding post gizmo was used as a feed point, with a choked feedline. I noticed little if any difference between the bottom leg being vertical or horizontal, but then I'm not (as previously demonstrated) being terribly scientific about it. It turns out that the configuration shown, just a quarter-wave vertical with a bunch of radials at ground level, works great, sets up easily, and is less filling.

I'm working on another antenna for Field Day. As soon as I can go out to test it, I'll get some pictures up.

You may recall the hand key from Leo's (K1LK) article in the December 2024 Signal. Just a bit was shown, but that's the key on the left, in the *before* pictures. Leo sat down with a can of Nev'rDull for what I suspect was a *number* of hours, yielding the lovely key below.

Nice job, Leo!



Resurrection of a Classic HB Amplifier - #1

Rod WA1TAC

The author has been interested in linear amplifiers for several decades and with this article documents the trials and tribulations of getting a home made linear back on the air. This amplifier was built by a former NVARC club member, Jim Hanson, W1TRC (SK). It helped him get to the top of the ARRL DX Honor Role and was purchased from his estate.

The amplifier uses a pair of Eimac 4CX300A tetrode tubes in Class AB1 grounded cathode operation. The 4CX300A is a compact, external-anode tube with 300 watts of plate dissipation; see Figure 1. The two are electrically connected in parallel and mounted in airflow sockets in a closed chassis, and cooled by forced air. Grounded cathode operation for a tetrode requires three voltage supplies in addition to the heater voltage, negative control grid bias, positive screen voltage and a high voltage, high current plate supply. Normally, grounded cathode amplifiers need to be neutralized to avoid oscillation problems but in this case a 50 ohm non-inductive swamping resistor was used on the control grid input to provide both a steady load to the driver (transceiver) and kill any oscillation tendency. Typical SSB linear operation for two tubes is with 2000 volts on the plate and a peak current of 500 milliamperes.



Figure 1. Eimac 4CX300 External Anode Tetrode

Figures 2 and 3 show the RF deck and its superb construction. The three controls on the front panel, from left to right, are Plate Tune, Bandswitch, and Plate Load; the left meter is plate current and the right is screen grid current. No tune-up means were included necessitating an external power indicator such as an inline wattmeter. The rear mounted blower that pressurizes the bottom chassis and provides cooling for the tubes was removed for these pictures.

The power supply assembly containing the three voltage supplies was built on a separate chassis; it is the center unit in Figure 4. The three switches, from left to right are heater and blower power, screen grid power and high voltage; the meter shows high voltage.

This amplifier went off the air approximately 20 years ago when its HV transformer burned out. After

Classic HB Amplifier

the unit was acquired, some modifications were made to both the bias and screen supplies and work began on a new high voltage power supply (HVPS). The space on the PS chassis where the original HV transformer resided was limited and no direct replacement could be found ; hence a decision was made to use a third chassis for the new power transformer. The selected HV transformer was a 2400 to 240 volt line distribution transformer rated at 1 kVA run backwards; it was removed from its cast iron case, allowed to seep oil for a month and then mounted on a separate chassis along with a large choke for the choke input filter, full wave bridge rectifier and a contactor for the 240 vac input. No surge current limiting was deemed necessary because of the choke input filter.

In initial testing the PS provided about 2100 volts DC under load and the amplifier gave almost 300 watts output with 25 watts drive. However, after rearranging the ham shack and moving the amp into position, disaster struck. A HV short developed in the HVPS as the amp was being used, blew the PS fuse, and also the screen grids on both 4CX300 tubes. At this point the amp went into misuse again. One problem with the external anode tubes is their relatively fragile (low dissipation) screen grids. A current limiting circuit is an excellent idea in case of loss of plate voltage.



Figure 2. RF Deck – Front View

Classic HB Amplifier

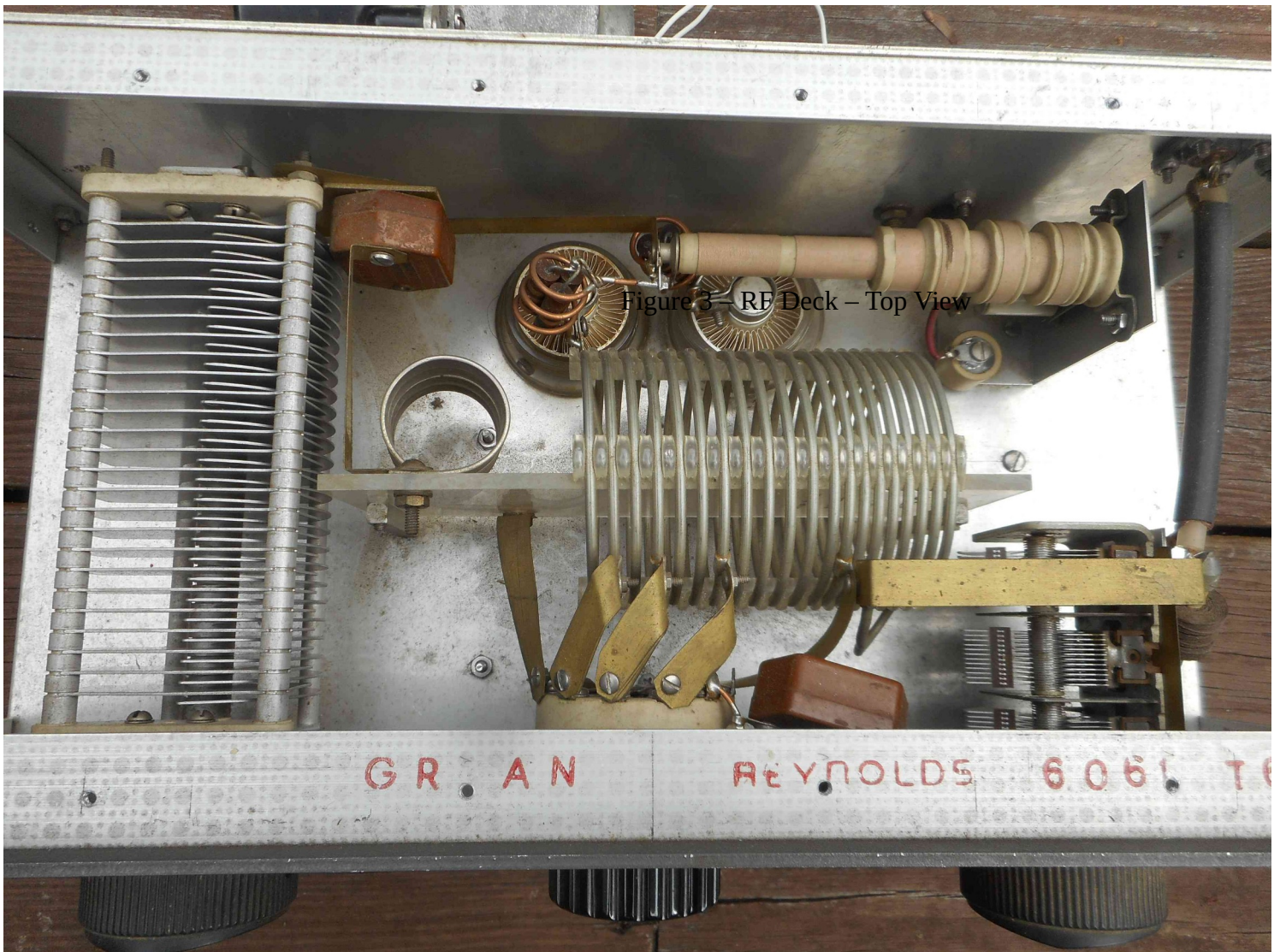


Figure 3 – RF Deck – Top View

After some time a pair of replacement 4CX300s was found and work began on getting the amp running again. The first step was to install a screen current limiter circuit from an ARRL Handbook and the second was to investigate what shorted in the HVPS. Efforts at the latter task were inconclusive even after many tries and many blown fuses. Trouble shooting a 2000+ volt power supply is not a task to be performed with haste. At this point the author remembered that he had a 3 kV, 100 ma. HVPS in its own 19 inch rack. A few modifications were made to reduce the output voltage and increase its current capability. It is the bottom unit in Figure 4.

Classic HB Amplifier



Figure 4 Amplifier and Power Supply Stack

Initial tests with the 'new' HVPS were successful; it showed 2100 vdc no-load and 1900 vdc at 200 millamps current draw (400 watts of power). The correct idle current value for each tube, 100 ma., was set using the individual potentiometers on the rear panel of the bias and screen supply chassis.

The first on-the-air test occurred in early January in a 20 minute, 40 meter QSO with another ham in South Carolina. He reported a clean, strong signal at his QTH. The author estimates that the amplifier's output power was about 400 watts. Finally, success at the restoration of a vintage HB amp!

Future tasks include measuring its gain and determining the maximum allowable drive level to avoid driving the tube's control grids positive and entering Class AB2 operation. The control grids in most external anode tubes were not designed to dissipate power. The maximum drive level may vary with the driving transmitter depending its degree of speech processing. Some thought is being given to adding a circuit that senses positive grid current to serve as a drive warning indicator.

One vintage amp down and one to go.

I do wish I'd had one more page of content.

Nashoba Valley Amateur Radio Club
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Join NVARC! Annual dues are
\$15 individual, \$20 family

Contact us on the N1MNX repeater:
442.900(+) PL100
147.345(+) PL100
53.890(-) PL100

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to reach the newsletter editor.

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