CAARA NEWS

Cape Ann Amateur Radio Association
Gloucester, Massachusetts
NOVEMBER- 2026 EDITION

PRESIDENT'S COLUMN

By Brandon- NQ1W



Dear CAARA Members,

As we head into the final stretch of the year, please mark your calendars for December 12th, 2026! We are thrilled to celebrate our 50th-anniversary bash and annual holiday party at the clubhouse. Reaching half a century of amateur radio on Cape Ann is a wonderful milestone, and this promises to be a fantastic evening filled with great food, camaraderie, and a rich celebration of our shared history. I hope to see you there!

Our community outreach efforts have also been active recently. James Barber (K1TT), Jon Cunningham (K1TP), and I had the pleasure of working with Eric Sabo's capstone STEM class at Rockport High School to teach students about pico ballooning. Together, we launched four demonstration balloons and assisted the students in launching two of their own. We look forward to future collaborations, including a potential nautical drone boat project.

Within the club, I am delighted to announce that Maurice Martini (N1UV) is stepping up as the new committee chair and coordinator for the CAARA Elmer's program. Look for more details on the revitalized program in the coming weeks.

A warm thank you to the volunteers who recently cleared out the clubhouse basement. Your hard work allowed us to complete our energy audit in record time, paving the way for potential capital improvements to help mitigate utility costs.

To address increasing operating expenses—including rising costs for heat, electricity, and insurance—we will soon share details on two upcoming financial initiatives:

- 50th-Anniversary Merchandise Fundraiser: We will be offering anniversary gear featuring artwork generously donated by an anonymous member. See the advert in this monhs newsletter. Lots of cool items to be had for a great cause!

- Proposed Dues Increase: We will ask the membership to approve a new budget that includes a slight increase across all membership types. This is our first requested dues increase in over a decade, and it ensures we can continue operating our facility. We understand financial hardships may arise; as in the past, members experiencing difficulties are encouraged to reach out to the board so we can ensure you remain in good standing. More details will follow.

Finally, we are seeking clubhouse presentations for the upcoming months. If you would like to present on a topic, demonstrate gear, or suggest a guest speaker, please let us know.

Thank you all for your continued dedication and support for CAARA. I look forward to seeing you at the clubhouse and hearing you on the air!

73,
Brandon NQ1W



CAARA Newsletter
Cape Ann Amateur Radio Association
6 Stanwood Street
Gloucester, MA 01930

CAARA Newsletter is a monthly publication of the Cape Ann Amateur Radio Association (CAARA).

It is the policy of the editor to publish all material submitted by the membership provided such material is in good taste, relevant to amateur radio and of interest to CAARA members, and space is available. Material is accepted on a first come, first serve basis. Articles and other materials may be submitted by internet to Jon at jpcrockport@gmail.com . If possible, material should be in Word format. Material may also be submitted as hard copy to Jon-K1TP or any Club Officer.

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Welcome to CAARA:

CAARA, an ARRL affiliated club, operates the 2 meter W1GLO repeater on 145.130 MHz with antennas located on the ATT cell tower in the Blackburn Industrial Complex in Gloucester Massachusetts. It has an average effective radius of 60 miles, and serves Eastern Massachusetts, Cape Cod, Rhode Island, Southern New Hampshire, andmaritime mobile stations.

CAARA also operates the W1GLO repeater on 224.900 located at the CAARA clubhouse.

The 443.700 repeater is now on the ATT cell tower in the Blackburn Industrial Complex with greatly enhanced performance running in fusion mode and linked to 10 other repeaters in the New England area.

The Association is one of the few amateur radio clubs that has its own clubhouse. Located at 6 Stanwood Street in Gloucester, with a variety of HF stations with beam, vertical, or G5RV antennas.

Amateur radio exams are held on REQUEST at the CAARA clubhouse. Anyone who is considering a new license or an upgrade, is welcome to test with us. Currently pre-registration is necessary. Contact the head of our VE team Bill Poulin- WZ1L if you have any questions about monthly testing.

Monthly member meetings are held on the second Saturday of each month at noon except for July and August.

Each Sunday evening at 7:00 PM, the club operates a 2 meter fm net on 145.130. This is an open and informal net which disseminates club news and prepares operators for emergency communications work. All are invited to check into the net as club membership is not a requirement.

The club is open every Wednesday from 10- Noon for CAARA members and interested parties to stop by and socialize, as well as use the extensive collection of ham radio gear.

This newsletter is published under the auspices of the Cape Ann Amateur Radio Association (CAARA), However, all content is the work of individual contributors and may contain ideas, opinions or views not necessarily shared or supported by the CAARA Board of Directors or the membership.

THE EMCOMM MINUTE

By Dean- KB1PGH



So I have not covered this topic of Emergency Preparedness in a while and since things are slow I might as well do it since I have the chance. So back in 2010 the city of Gloucester had a CERT (Community Emergency Response Team) , unfortunately it is no longer around. On one of the training course classes they covered how to make a "Bug Out" bag in case of disasters. They actually gave us a CERT backpack that we could store our stuff in case of a emergency. So for this months article I will cover what you can put in a "Go Bag" just in case you have to evacuate your home in a emergency or you could use it if you are manning a emergency communications station for amateur radio.

So I have my old CERT backpack stuffed with emergency items. Now I could open it up and blow it all apart for you but I will give you a list of the basics that you should have in any home emergency go kit.

So the first would be a good heavy duty flashlight. I use the NEBO brand-they cost a few more dollars but are worth the investment. I also have a bottle of water as well. The next is to get a good first aid kit that can cover you and your family. You can create your own or buy them anywhere.

For a few suggestions I like to keep those nitrile gloves, some burn, itch and rash ointments inside. Plus a tourniquet and eye drops and some blood clotting powder.

Also don`t forget a cold pack and if you want to get fancy you can get some potassium iodide tablets for radiation. I know we live near Seabrook nuclear power plant so you never know. A couple other things to remember is if you do have to leave your home for a emergency don`t forget to bring whatever prescription medicines you may need. The next is a source of power. I have a decent size power bank inside a storage bag with all the cables I use for our phones and devices.

I recommend the Anker brand of power banks. I keep one in my car as well just in case. Plus even if the power goes out at your home you can use them.

The next thing in there is I have a storage bag full of toiletries such as toilet paper, tooth brushes, toothpaste , deodorant, and shaving items. Just think of what you would need if you were staying at a hotel for a day or two.

I also have a multitool in there as well in case I have to cut something. So if the power is out and no ATMs work I have some currency in an envelope inside the go kit as well. I think I got $40.00 and some change in there as well. It`s not much but it`s something if I need it in a pinch. So I had mentioned a bottle of water earlier and as you can see in the photo I have it in a insulated water tumbler. You can also put a bit of food in there as well. Obviously something that is sealed and won`t go bad for a while. Even if its something simple to hold you over for a bit. I actually put a couple of those tuna fish packets with a fork and some of those Cliff bars inside a storage bag. As long as your go kit is a cool dry place it will be fine and you can always rotate it out and use if before the expiration date. Just remember to swap your water out every few months as well.

One last thing is to think about is what would you have to take with you if you have a baby or a pet? You would have to bring baby formula and diapers and for a pet some pet food and a carrier.

So those are some of the basics of a Bug out kit but of course you can build one out to whatever you want. If you need more ideas you can Google 72 hour go kits or if you do not want to build your own you can fund plenty of them online. Just think of what you need to survive for a day or two if you had to leave your house in an instant.

Oh, I almost forgot. If your into amateur radio don`t forget to bring your HT and a spare battery for back up emergency communications.

Now of course if you want to go further you can get emergency food and water storage items. In my basement I have a storage bin with a 72 hour freeze dried food box with 3 meals for each day and then I have a 24 pack of 16 ounce spring waters and a small portable stove to cook it in and paper plates and utensils. We could go on and on with emergency preparedness and bug out kits but you get the idea.

One a side note for safety. I went to start my car to go to work and all of a sudden it was running rough. So when I checked my engine I noticed that either a mouse of chipmunk had chewed through one of the wires in my cars engine leading to a spark plug. So luckily we were able to splice the wires together and fix it. The thing is my car was inside a detached garage too. So now since it is getting colder take a moment to check you engine to see if you see any chewing activity. I now have a couple bags of mothballs on the floor in the garage and I got one of those anti rodent plug in things that makes a high pitched noise. Plus I sprayed some peppermint oil around the inside of the engine since rodents hate peppermint. So if your car sits outside all night long beware, especially so if you are around woods. I found a tiny hole on the side of my garage where door where they were sneaking in. It might save you a costly repair bill!

See you next month and 73, Dean

How NOT to buy Ham Gear

by Curtis- AA3JE



There are hams who do a really good job buying ham gear. They determine an objective, make rational inquires, do a little research on line and in the ham shops, buy what they need, read the manual carefully, put it in service and operate happily!
I envy them, I really do. They are such beautiful people.

I am a person. I am not beautiful.

I do it in reverse. I start by going to ham fests, reading catalogs, trolling equipment lists on QRZ, and suddenly a piece of gear speaks to me.

"I am sad and lonely on my owner's tailgate. Help me, Save me! Make me work again!"

So I get out the checkbook, peek at my bank balance, and order something. The UPS guy sweats and strains, and another boat anchor appears on my porch. It could be a hybrid rig from the 1960s (half transistors with burnt out tube finals). It could be a kilowatt amplifier with huge and scary high voltage mercury amplifier tubes that blanks out televisions for blocks around. It could be a Tuned Radio Frequency receiver from 1923 that mice have lived in for fifty years. If you are really lucky, it is a Talk Between Ships unit from a WWII Destroyer Escort.

Anyway, it may or may not work, (somebody put it aside for some reason), and in the worst case someone has cut the power cord off as a warning to the unwise. So the first step is to see if anyone knows anything about it. Sometimes this actually works though the WWII hams are really old now. The next step is to search for an owners or service manual. These are often available. You send off a check, and in a month or so a blurry xerox arrives. These days you can even find some on the internet.

The next step (after removing the mouse shit) is to find missing tubes or parts. eBay is helpful here in finding tubes last used in 1932. I do not recommend dealing direct with Ukraine or Bulgaria, and STRONGLY recommend against sending your credit card number to foreign parties unknown. Usually old electrolytic capacitors need replacement and tube sockets are corroded. Vietnam era field radios are particularly bad in this regard.

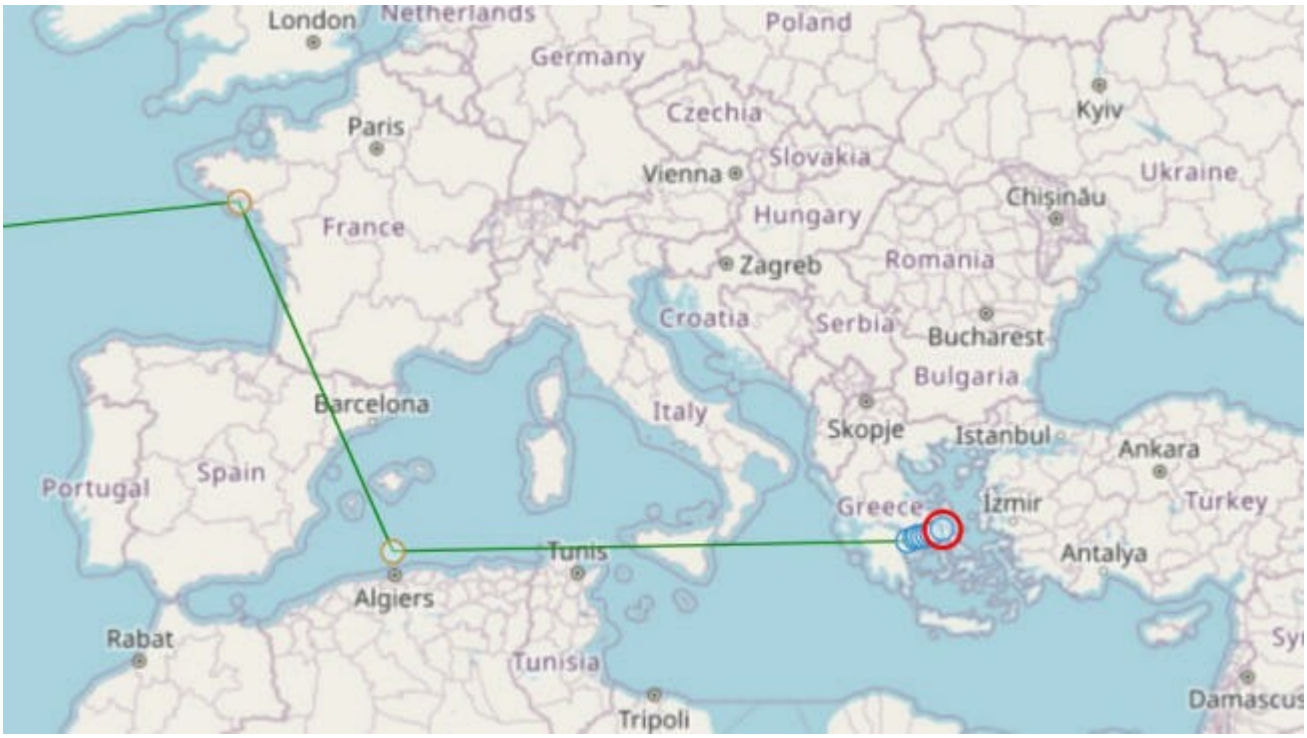
Now here is the problem. The cheapest modern set is an order of magnitude better than the very best old rig. Unless you find a very patient pal who is willing to chase your wandering signal over the band and have a cast iron skin to accept the criticisms of those polite hams whose signals you tromp on, avoid old rigs with analog frequency control on crowded bands.

So you break down, and buy an ICOM, Yaesu, or Kenwood modern radio. Not the current model, last year's wonder radio (or a few years ago). Be prepared for controls. Lots of controls. Maybe 88 or so. Controls that if touched, immediately disable the radio. Press one wrong button and the rig goes silent. Press two wrong buttons and nothing ever works. The manual is very helpful, but has a "fault fixing" section that puts NASA to shame.

So here is a tip from someone that has HAM FEST DISORDER. Take a friend, have him blindfold you and lead you past the tables of old junk, muttering something about "Hope your flash burns heal soon."

But if your TBS radio from 1945 has a burnt out power transformer from a shorted inter-connect cable, I'm your guy.

CAARA MEMBERS TEACH ABOUT PICO BALLOONS AND AMATEUR RADIO AT ROCKPORT MIDDLE-HIGH SCHOOL





CAARA members Jon-K1TP, Brandon- NQ1W, and Jim- K1TT teach students about pico ballooning during their technology class. Students were involved in soldering solar cells, calculating antenna length, designing the payload and launching the pico balloon which attains an altitude of 40,000 feet and reports back with location, temperatures, solar cell voltage. Above photo shows the tracking of the balloon and the bottom photo of the kids just releasing the balloon.

CAARA Celebrates 50 Years!

Half a century of amateur radio, friendship, and community | 1976–2026

For half a century, CAARA has brought together ham radio enthusiasts from Cape Ann and the wider North Shore to exchange ideas, explore technology such as balloon launches with Rockport High School, serve our community including support for a dozen YuKan half-marathon races this year and celebrate our hobby through activities like Field Day and fox hunts, along with the friendships that make amateur radio so rewarding.

A Golden Anniversary Holiday Celebration

This December, our annual holiday party and members' meeting will be something special. We'll gather at our Gloucester clubhouse—a resource at the heart of CAARA activities for decades—to celebrate our first 50 years.

We're planning special activities and a few surprises. And, of course, we'll enjoy our traditional barbecue feast from the Big Pig in Peabody. Whether you're a longtime member or have only recently joined, we hope to see you there. Details to follow!

Take Home a Piece of CAARA History

We've created commemorative items to celebrate this milestone and support the club. Our centerpiece is a 15-ounce ceramic mug featuring photographs of our clubhouse in 1976 and today, including its new accessibility ramp and freshly paved parking lot.



Anniversary mug: $20 • Ballpoint pen: $5 • LED flashlight: $5

Key fob: complimentary with any donation. The pen and flashlight feature the CAARA logo and W1GLO call sign.

Celebrating Our Past —Supporting Our Future

Anniversary donations help maintain our clubhouse and support club activities. No donations are too large! Can?t visit in person? We can mail your selections for a $5 packing and postage charge.

Two Ways to Donate

Online donation

Visit the CAARA website. In the black box beneath the pictures, find the first row of links and select **‘Donations”**, then **‘Donations to CAARA”**. Click **‘Donate”**, enter your amount, choose **PayPal** or **Debit/Credit Card**, and complete the transaction.

Email your selections

After donating online, please email **treasurer@caara.net** with the amount donated (including mailing and handling charges) and the items selected for example, 2 mugs, 1 flashlight, and 1 pen.

Donate by check

Alternatively, mail a check with a note listing your selected items and your mailing address to:
Treasurer
CAARA
6 Stanwood Street
Gloucester, MA 01930

We hope every member will join us in celebrating CAARA’s history and supporting its next chapter.

Here’s to the next 50 years! 73 from CAARA —W1GLO



CAARA proudly celebrates 50 years as an active amateur radio club on Cape Ann with our own club facility complete with 2 floors of operational modern and vintage radio equipment.

We sponsor active repeaters on 2, 220, and 440 providing informational weekly nets on M-W-F-Sunday, provide safety coverage for the YukanRun ½ marathon road races, as well as city events.

We offer amateur license classes and testing at the club on a regular basis.

The club is open to all every Wednesday morning for coffee and donuts as well as the use of the radio stations an monthly meetings with luncheon and speakers.

Please come to the December 12 Holiday and 50th Celebration meeting and enjoy a delicious catered BBQ lunch, a fun Yankee Swap, and a 50-50 Raffle, and meet your fellow club members.

From the Workbench - The Heathkit DX-60B - Part B

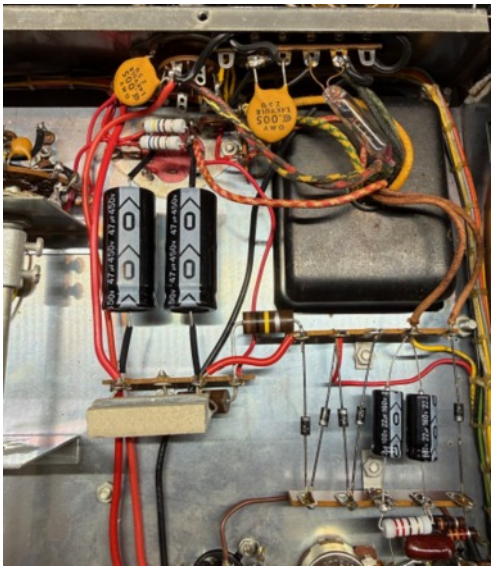
(Maurice N1UV)

As a recap of last month's Part A installment detailing the restoration of the DX-60B, I managed to test and swap out a number of resistors and swapped out one wax capacitor (which subsequently tested high on leakage). Two other mid-value capacitors were found to be of the Mylar variety and were left in place. A number of modifications were also completed: added a switching relay in the HV circuit to preserve the Function switch; added meter protection; added a TRS socket for the microphone input; and added jumpers across two tube sockets to eliminate possible erratic keying. See *Part A* of this article for the details of these mods. An order was also placed with Hayseed Hamfest for a recap kit.



With that, the DX-60B was moved to one side of the bench waiting for the recap kit to arrive.

A few weeks later, the kit finally arrived, and it did not disappoint. Included in the kit were higher spec capacitors, which, more importantly, were of high quality and higher operating temperatures. The values were a little larger (eg, 47µF instead of the 40µF original). The can capacitor was in a brand new shiny container and was designed to be a drop-in replacement.



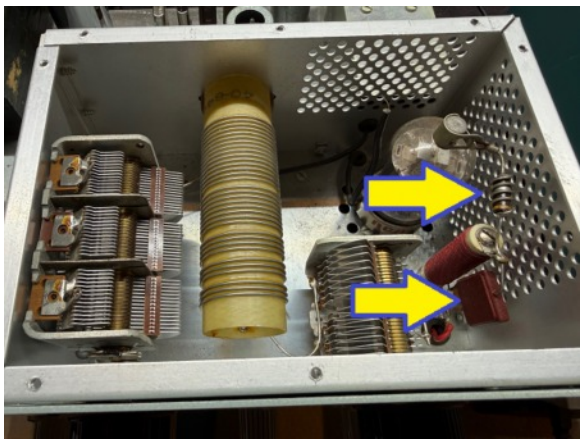
Time to warm up the soldering iron!



The axial capacitors were easy to swap out, however, the can version needed a lot more care.

In keeping with point to point wiring, the lugs on this capacitor were used to terminate many components and leads. Care had to be taken during the resoldering process to ensure that each termination went to the correct lug. And it's a little squashed in there!

With that all done, attention was turned to the finals' cage (see right). Visually, all appeared good, however a few components need to be checked out, nonetheless.



First, the DC blocking capacitor (bottom arrow). It was checked for mechanical and electrical integrity. Definitely don't want 650V appearing on the antenna!

Second, the parasitic choke (top arrow) was checked. All good here!

Third, C21 (68pF 4kV - not shown) was checked. This capacitor is used as a pad across the Tuning variable capacitor and is switched into circuit when 80M is selected on the Band switch. This has a tendency of failing if the DX-60B is operated on 80M without an antenna. Again, no signs of damage or stress was seen. With that, the cage lid was reattached with just a couple of holding screws as one extra step (neutralization) needs to be completed inside the cage after powering up the transmitter.

One more thing. Since I will initially be using the transmitter with crystals, I obviously had to populate the holders with some. There are four sockets on the rear of the transmitter. Three of the sockets are meant for FT-243 style crystals, while one is meant for HC-6/U crystals. Fortunately, CAARA had a number of suitable 80 and 40M crystals I could use. In the end, I decided to use one 80M crystal (mainly because the tune up process starts on 80M), and three 40M crystals (all in the General portion of the CW segment). Incidentally, most of the HC-6/U crystals at the clubhouse had pin sleeves attached which allowed them to be used in an FT-243 socket.



The frequencies I ultimately chose were as follows:

- *X1: 3560 kHz*
- *X2: 7030 kHz*
- *X3: 7035 kHz*
- *X4: 7040 kHz*

As a reminder, the DX-60B uses a doubler for 20M, tripler for 15M and quadrupler for 10M. Therefore, as an example, X2 on 7030 can also be used on 14060, 21090, and 28120. Careful choice of crystal will land you where you desire to be in the CW segments of the upper bands.

Time for the smoke test. Or ideally, a “no smoke” test! With a dummy load attached, and power via a Variac, I performed a controlled power up of the DX-60B. With no issues seen, full voltage was applied. After letting the tubes warm up, I ran through the Function switch range to ensure the new relay energized at the appropriate points. Spoiler alert - yes it did!

Next step was to go through the Initial Test and Adjustments section of the Heathkit Assembly Manual. Since I have a real dummy load, there was no need for a 75W bulb dummy load as suggested... not that I have any non-LED varieties anyway. All the Grid and Plate currents were spot on!



Grid current at 2.5 mA



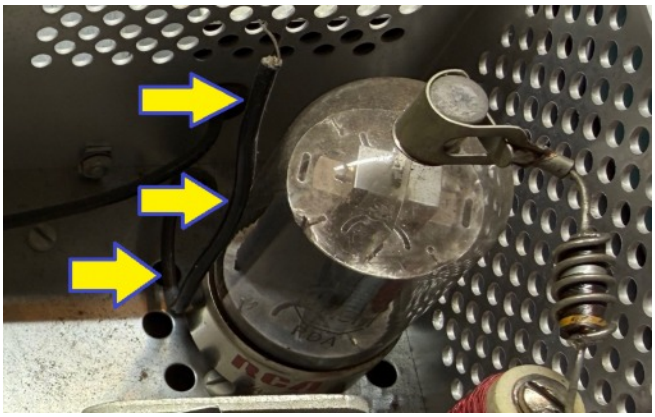
CW Plate current at 150 mA



AM resting Plate current ~60 mA

The last step before replacing the covers and being able to use the DX-60B was to perform the neutralization steps in the manual. Those of you who are unfamiliar with what neutralization is all about, in a nutshell for tube amplifiers, you want to balance out the plate to grid capacitance of the final tube(s). This is meant to remove/reduce any positive feedback between the output (plate) and input (grid) so that the tube amplifier is stable and doesn't go into oscillation. It is usually performed on 10M.

This is done by using external capacitance and in the case of the DX-60B, is accomplished by way of a neutralization stub (ie, a piece of wire!) close to the tube itself (see picture on right with arrows showing the stub). The process calls for adjusting the stub (bending etc) until the tube is fully neutralized. Luckily, this is performed without any B+ voltage on the tube plate (ie, cap). Now that would hurt if brushed against! This is done by removing the connecting wire to the large choke in the finals' cage (partially obscured at the bottom right in the picture on the right).



The procedure calls for the use of a GDO or VTVM. I opted to use my VTVM with an RF probe since I was able to lay my hands on that quickly. The process was a bit finicky as things changed every time my hand came close to the stub, but, with a bit of patience, I was able to achieve the required result. The wire connecting B+ to the choke was reattached.

A quick check of the voltages showed all was per the schematic. A nice healthy B+ of 650V was measured as well as -140V bias.

With that, all the covers went on and the DX-60B is ready for operation!

Trying it out on CW, the transmitter sounded good on a nearby receiver, and on the scope, the keying waveform was a little steep. Based on some research, this is all completely normal for the '60B. There are some modifications that can be done to soften the keying envelope, but I decided to keep this transmitter as original as possible.

In relation to power **output**, the DX-60B on CW measured around 40-45W on 80 and 40M, with the power decreasing slightly as it was tuned to the higher bands. This is in keeping with the stated 90W **input** power. On 10M, output was measured at around 35W. One thing to note is that the DX-60B uses grid block keying (ie, negative keying), and thus there is approximately -75Vdc (in relation to chassis ground) at the key. Something to note when wiring up a hand key or using a keyer. I'll cover the AM side of things after the VFO is attached.

Overall, I'm very satisfied at how the restoration went. A great looking transmitter that operates extremely well!

For the sake of completeness, I'll reproduce the operating instructions on the next page. These came directly from the manual and if followed correctly, the '60B should perform flawlessly. Two items to note:

- Always start with the LOAD control fully counterclockwise (Step 7)
- Always reset the grid bias back to 2.5 mA at the end before operation (Step 18)

This process may look daunting at first, but rest assured, a little practice will have you tuning the '60B up like a pro.

OPERATING INSTRUCTIONS FOR CW OR AM

1. Plug the line cord into the AC outlet and check to be sure the antenna is connected.
2. Turn the FUNCTION switch to STBY.
3. Set the DRIVE LEVEL to about 2-1/2.
4. Select desired XTAL or VFO mode.
5. Select the desired BAND.
6. Set the FINAL TUNING capacitor in the desired band area as indicated on the front panel.
7. Set the FINAL LOADING control fully counterclockwise.
8. Set the METER switch to GRID position.
9. Turn the FUNCTION switch to TUNE.
10. Rotate the DRIVE TUNE control for maximum grid meter reading.
11. Set the DRIVE LEVEL to 2.5 ma of grid current.
12. Change METER switch to PLATE position.
13. Turn the FUNCTION switch to AM position.
14. Rotate the FINAL TUNING control to obtain a minimum plate current meter reading.
15. Turn the FUNCTION switch to CW.
16. While maintaining minimum plate current by tuning the FINAL TUNING control, increase the FINAL LOADING control in small steps in a clockwise direction until the Transmitter is loaded to 100 ma for Novice operation or 150 ma for regular operation.
17. Return the METER switch to GRID position.
18. Check and reset the grid drive to 2.5 ma if needed.
19. Return the FUNCTION switch to STBY.
20. Return the METER switch to PLATE position.

CW

1. Insert key plug in key jack.
2. When ready to transmit turn the FUNCTION switch to CW and proceed. (NOTE: In the key-up position on CW, the final plate current will be approximately 5 to 20 ma.)

AM

1. Remove key plug from key jack if in place.
2. Connect microphone.
3. When ready to transmit, turn the FUNCTION switch to AM and proceed.

OPERATING REMINDERS

A. If frequency changes of more than a few kilocycles occur, the final amplifier and driver stages may require retuning.

B. Operation of the Transmitter without a crystal, a proper antenna, or dummy load will result in component failure.

C. Operation of the Transmitter with the final amplifier not tuned to resonance (minimum plate current) may ruin the final amplifier tube.

D. Use caution and observe rules of safety in making all voltage and current measurements.

E. Do not cover cabinet ventilation holes.

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With the DX-60B now fully operational in “standalone mode”, my attention turned to the VFO that was also donated by Vince, K1VF. This particular model, the HG-10B, was released by Heathkit around 1966. It comprises of two tubes: an OB2 voltage regulator, and a 6CH8 triode-pentode used as an oscillator and buffer. The HG-10B does not contain a power supply, and instead, draws power from the DX-60B.



The frequency is read from the large slide-rule style dial. This dial comprises of a drum printed with a frequency scale for each of the bands. The illuminated dial rotates with the band switch so only the scale for the band selected is visible. The VFO tuning utilizes a 28:1 vernier anti-backlash gear system. By all accounts, even though the Heathkit manual is clear with the assembly instructions, it has been reported that once the VFO is complete, you could well be empowered to fix your own car’s transmission!

HG-10 / HG-10B FREQUENCIES

Freq. Range 1:

Band (M)	Band (mc)	VFO Freq. (mc)	×
80	3.500 - 4.000	3.500 - 4.000	1

Freq. Range 2:

Band (M)	Band (mc)	VFO Freq. (mc)	×
40	7.000 - 7.425	7.000 - 7.425	1
20	14.000 - 14.850	7.000 - 7.425	2
15	21.000 - 22.275	7.000 - 7.425	3
10	28.000 - 29.700	7.000 - 7.425	4

Freq. Range 3:

Band (M)	Band (mc)	VFO Freq. (mc)	×
6	50.000 - 54.000	8.333 - 9.000	6

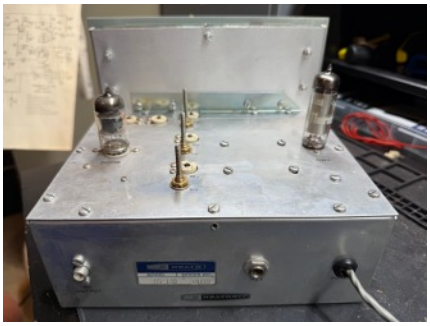
Freq. Range 4:

Band (M)	Band (mc)	VFO Freq. (mc)	×
2	144.000 -148.000	8.000 - 8.222	18

Notes:
1. × is the multiplication factor that occurs in the transmitter.

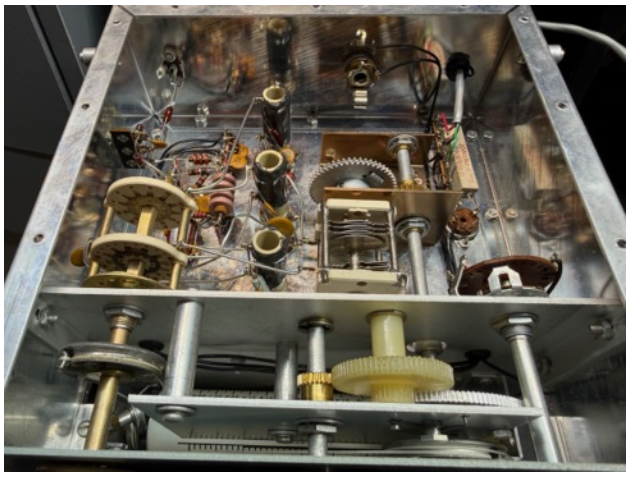
Connections to the DX-60B comprise of a cable terminated in an octal plug, as well as a shielded cable terminated with RCA plugs. The connection with the octal plug supplies the VFO with B+ of 300V as well as filament voltage and keying logic. The separate shielded cable supplies the VFO signal to the ’60B.

Before plugging the VFO in, it’s now time to open it up and do an inspection. Just like the ’60B, I was impressed with the level of workmanship. Everything was clean and well soldered. See the pictures to the right.



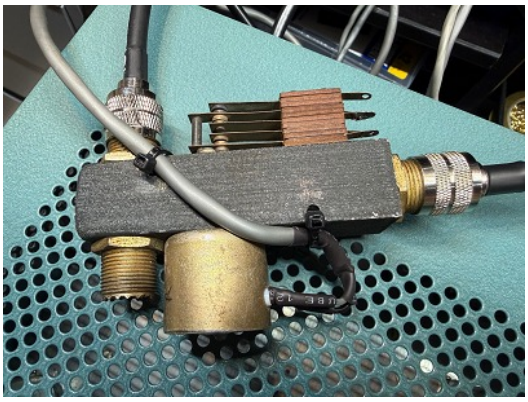
Since there’s no power supply in the VFO, there are no electrolytics. However, there are plenty of carbon composite resistors. After checking each one, I was surprised that none were out of spec. That was easy! The gear mechanism showed no sign of wear or sticking, so was left alone.

With that in mind, I just closed the VFO up, plugged it into the DX-60B, and fired the whole station up. Selecting the correct band (80M to start) on both the VFO and ’60B, key in place, VFO in the OPR position, I was graced with a nice sounding signal. Couldn’t be simpler. The only issue I saw was that the dial position on the VFO was a little off compared to the generated signal frequency. That was easily corrected within the VFO. Mind you, the VFO is not a NIST standard, but is good enough for general use if left to warm up for about 15-30 minutes. I would not use it near the band edges unless it’s coupled with a frequency counter.



Two things left to do.

First, I wanted to add an antenna change-over relay to the station. The ’60B has a switched set of contacts (120V) on the rear octal socket that is energized when either CW or AM is selected on the Function switch.



Joe- K1WPO donated a Dow-Key antenna change-over relay so it was simple to wire that up to the same octal plug used by the VFO. As can be seen on the right, this relay also has a set of dry contacts that can be used for other purposes, such as muting the receiver when transmitting, keying an amplifier, powering an “On Air” sign etc.



Second, how does the DX-60B work on AM? To find out, I had to find a high impedance microphone since that is what the ’60B is designed to use. Luckily, the club had a number of suitable candidates in the upstair’s bone yard, so, in the end, I chose a nice looking ElectroVoice 630 and stand which had a PTT included.

Yes, beauty is in the eye of the beholder!

A quick clean, and after resoldering some iffy wiring connections, I had a fully functional microphone with the correct TRS plug wiring.

Before talking about the results, a quick word about AM and the DX-60B. This transmitter employs what is known as controlled carrier modulation. This method of modulation keeps the carrier level low until modulation is applied, and is usually accomplished by applying audio to the screen grid bias of the final’s tube (ie, the 6146). If this method was not overdriven, the results would have been a readable signal, although not very pleasant to listen to for the listener. The receiver’s AGC would also pump with the change of carrier level, causing an annoying rise and fall of background noise. Coupled with that, it was easy to overdrive and cause severe distortion. It was also inefficient. That begs the question - why? Easy answer - cost and simplicity! No modulation transformer was required, nor was a more powerful audio section needed, and the final’s design did not have to be as robust as one handling full carrier.



On the ’60B, if the modulation peak is kept at or below 75 mA plate current, it doesn’t sound too bad (notwithstanding the AGC pumping). Resting carrier is around 7W. On the scope, the PEP was calculated out to be around 40W when modulated to the 75 mA level, which is about right.



So, that’s it! A fun and rewarding project has come to an end. The station is now at the clubhouse waiting on its final destination. A big ***Thank You*** goes out to Vince, K1VF for donating this station to CAARA, as well as to Joe, K1WPO and Jon, K1TP who made this happen.

Incidentally, Vince mentioned that he also used a Hallicrafters HA-1 tube keyer with this station. Now, wouldn’t that be fun - finding and restoring one of those!

BASEMENT CLEAN OUT BY MEMBERS

The basement was cleaned out and the contents taken to a club member who recycles all of our junk who remains to be anonymous. The idea to clean out the basement has been in our thoughts for years but brought to the forefront by Ron- N1RJB who was getting us an estimate for insulating the building with a MA Energy grant. They would not do the basement unless it was cleaned out. I want to thank the members who got out of their seats during coffee and donuts time and got the job done.





Novelty Radios by Jeff-AE1CG



My radio obsession has led me to collect many types of receivers and transmitters, from different eras, made for different purposes. Usually the collection starts with me stumbling upon an unexpected gem then wondering what other radios of that category might have been built.

In this article I am focusing on the Novelty Radio where radio technology and functionality intersect with product advertisement. It takes us back to a time when radios, and radio as a medium (broadcasts, specifically AM radio) were engrained in the society as a primary source of entertainment and information. It was important enough that companies would spend advertisement dollars selling or giving away radios with their logo on them, knowing that these radios would be seen and spread the marketing message.

My focus is on the radios I have which limits the examples to genres I am interested in. Therefore you won't see any Mickey Mouse or Smurf radios although they are out there!





Each of these is an AM radio, the volume and tuning knobs are well hidden. These would have been available at auto parts stores and service stations with the purchase of a product.





The car battery radios have knobs on the top where the terminals would be. Clever!





These gas pump radios are particularly cool. Available for purchase with a fill up back before FM radio was widely available.





The next genre of novelty radios is fast food! I was not surprised to find Coke branded radios but I was happy to add Dr Pepper, Pepsi and Mountain Dew.







You said you wanted burgers and fries so here are the radios, with ketchup of course. A soda machine is available if you don't see your favorite here.



This radio has a tuner and advertises for the Detroit Tigers flagship station, WJR, easily heard here in MA.

Another novelty Radio genre I really find interesting is AM radios branded with a specific AM radio station's call letters and frequency. Many of these radios have no tuner and only receive the frequency of the station they display. These would be prizes at live broadcasts or call-in contests. Interesting things happen when the owner moves to a new city. Is there a local station on that same frequency? If not, would you DX for distant stations on only one frequency?





These radios are single frequency versions. You will recognize the one on the left!

The radio that looks like an old microphone is a tube set, single frequency. It is labeled 1450KHz, a 'graveyard' 1000/25 watt channel, so the station call would be on a tent sign on the top and the radio could be purchased by hundreds of stations on 1450 KHz



Another novelty radio category is Space and SciFi. There were many radios made in the hightech style of the 60s and 70s and just looked space related while others were obvious.

Here is a rocket radio, robot radio, flying saucer radio and spaceage globe.

Competing battery radios (that use batteries).









A radio for film? I wonder why that would sell film. Sports radios are common.



These crystal radios are batteryless, from when crystal sets were as cool as spare travel.

The one on the right had more than just low level RF involved as the melt marks show.

Special mention for the key chain radio by Panasonic. I won this at a town fair when I was a kid and although my date that day is beyond recollection the radio remains.



From KC1WQK's Radio Shed....

Last fall (2025) I built an HF linear amplifier using a pair of 813 tubes and various ham-fest and junk box parts. This was based loosely on the 1956 B&W L-1000 amplifier and did not include tuned input networks for the grounded-grid circuit. I've enjoyed operating this amplifier, but it presents a marginal impedance match to the driving ICOM 7300 transceiver's built-in antenna tuner, causing occasional power limiting on 80m and poor efficiency on 10m. This article describes some of the dopey things that I did on the way to building a working set of input matching networks for my amplifier.

Determining input impedance

The first step in designing the amplifier input networks was to determine the input impedance of the amplifier when tuned up on various bands. Obviously, the tubes needed to be operating since the input drive is at the cathode (filament) which is in series with the plate current.

I tuned up using excitation from the 7300 and an antenna load and then substituted a NanoVNA at the amplifier input to measure the complex impedance with the amplifier "keyed" on each band. Measured values ranged from 28 + j4 Ohms at 28.5 MHz to 130 – j30 Ohms at 3.75 MHz.

First experiments

Based on my measurements, I calculated simple 2-element LC matching networks for each band and built some compact tunable networks to attach directly to the input of my amplifier (see picture). I then autotuned the 7300 into a dummy load (to match 50 ohms). Finally, using the 7300 SWR function while driving the live amplifier, I tuned each matching network for lowest SWR. Expected L and C values when tuned were not anywhere near those predicted and some SWR measurements were above 1.5 with narrow bandwidth.

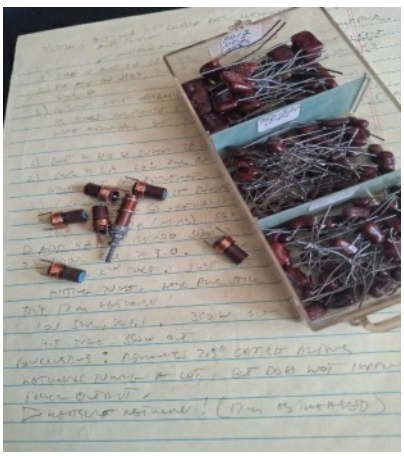


What went wrong: A NanoVNA puts out less than 1mW, while the amplifier is normally driven at 60W. Since the tube input at cathode sees the plate current, the input impedance will be very different at different drive levels, see w8ji.com/tuned_input_circuit. My input impedance measurements using the NanoVNA were misleading at best.

Also, a simple LC matching network does not permit control of Q as an independent variable. I needed three-component pi networks to design-in the desired bandwidth.

Determining input impedance (again)

It appears that a simple approximate calculation for grounded-grid input impedance is 1/transconductance or 1/3750 umhos = 267 Ohms for a single 813 connected as a triode, 133 Ohms for the parallel pair. Various sources on the internet suggested input Z values for the 813 pair of 130-150 Ohms. I decided to use an approximate impedance value of 140 Ohms resistive, build some networks, and see what happened, since I could not directly measure the driven Z.



Calculating pi network values

W8JI (ref. above) states that an input pi network Q of 5 is optimal for an amplifier like this, due to bandwidth vs. harmonic suppression tradeoffs. Other sources suggest Q values of 2-3. Based on my collection of silver mica capacitors, slug-tuned coils, and bandwidth approximation, I decided to work with Q around 4.5. By varying Q in small steps, I was able to tweak the networks to use my available input C1 values. Since the inductors on hand were adjustable, I could

tune out any error of capacitance on the output C2 side. Any resulting small error in impedance transformation would be easily matched using the 7300 auto antenna tuner.

Using a handy network calculator, sandiego.edu/matcher2, I came up with the following pi network values where C1 is the input cap and C2 the tube side. Note that the actual value of C2 is reduced by about 80pF to account for the capacitance presented by the tube filaments and filament choke. The 80pF estimate was based on the observed resonance of trial networks. The C2-stray values in the table are the actual capacitors used.

Freq MHz	C1 pF	L1 uH	C2 pF	C2-stray	Q
28.5	300	0.25	187	100	4.7
21.3	390	0.343	244	160	4.6
18.140	470	0.394	293	220	4.7
14.250	560	0.530	351	270	4.4
7.150	1200	1.000	764	680	4.7
3.750	2000	2.130	1298	1200	4.2

Table: 50 Ohm to 140 Ohm matching pi networks for parallel g.g. 813s

More experiments

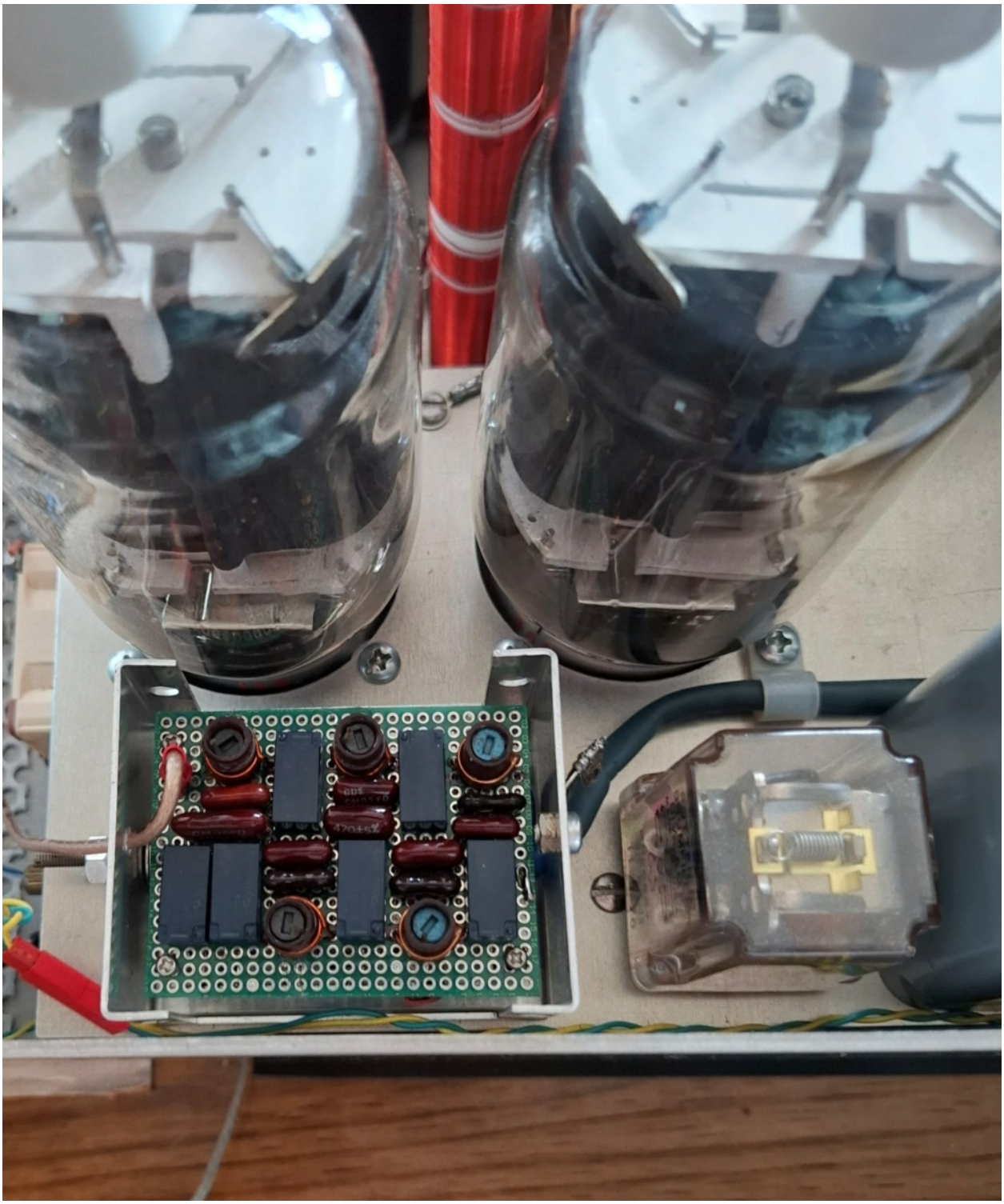
I rebuilt the external test networks using the tabulated circuit values and tuned each to resonance at 60W driving power. SWR seen by the 7300 was consistently 1.1 or better across each band and L1 inductance was subsequently measured at close to the predicted values. Something seemed right.

Construction

The amplifier's plate tank coil is an old used B&W unit with integrated band switch and there was no easy way to link a new switch for selecting the input networks, so I elected to use miniature 2A relays for network switching (Panasonic TX2-24V). My amplifier is compactly built, and there was no room left inside the shielded chassis containing the filament and bias circuits. It seemed risky to place the networks on the top of the chassis, but I wanted a short run between the networks and filaments and needed adjustment access, so I chose to package the networks in a small BUD box behind the 813s.

In the picture below the six band-selection relays are evident along with the networks for the 5 higher frequency bands. The larger 80m coil and caps are located beneath the proto board. The RG316 cable at left connects to the input at an antenna relay, while the output passes through a hole underneath at right directly to the 813 filaments. The 10m network is located at right closest to the output wire. The thicker shielded cable at right runs to a panel-mounted 1P8T rotary switch to select the pi-filter for the band or for pass-through mode.
Operation on 10 meters is now improved with 350W output vs. 260W maximum before. The amplifier continues to be stable even with the shield cover removed from the network doghouse. Output on other bands continues to be at the 450-550W level driven at 60W, and the ICOM tunes happily to 1:1 SWR. I have not verified expected improved harmonic suppression but may do so next.

Mike, KC1WQK, Gloucester



IMPORTANT NOVEMBER 14 MEMBERS MEETING VOTE

TOPICS:

1. Discussion on increasing dues to cover the increasing utility and building insurance policy.

2. Vote on changing the membership year to match our fiscal year. Membership will start on September 1 and end August 31