



Prospect Hill Intermod

The Newsletter of the Waltham Amateur Radio Association
and the "Heavy Hitters"

Fall 2007

Check out our web site at www.wara64.org !

INSIDE THIS ISSUE!

- Help Wanted
- Home Brew Tuner Tales
- New Meeting Site
- Field Day 2007

AND MUCH MORE!

SPEAKERS AND PROGRAMS FOR CLUB MEETINGS

There are always opportunities for you and others to make a presentation at one of our monthly W.A.R.A. club meetings.

If you have a favorite topic that might be of interest to our group, you can contact Rich, N1JDU on the air or via email at richard@n1jdu.org

To see if a particular meeting dates is in need of a program check the "Meeting Information" section on our club web site at www.wara64.org

Changing of the Guard

WARA welcomes new PHI editor Mark Bolls, K1KGG, and thanks outgoing editor John Flood, KB1FQG, for all the work he has put into our newsletter.

This space was originally filled with a Help Wanted item by KB1FQG. "We need a new newsletter editor!", he wrote. John came out of retirement last fall to do this newsletter again, and as you are all aware, the spring edition never was published, for which John was very sorry. He thought that as the kids got a bit older and started school, he'd have more time. (This is the point when you more experienced parents start laughing) In any event John needs to go back into retirement.

But lo and behold, at the September meeting, new member Mark Bolls, K1KGG, stepped up to the plate and volunteered for the job. Please help Mark in his new role...

WE NEED YOU –TO PARTICIPATE AND CONTRIBUTE!

Prospect Hill Intermod (PHI) is **YOUR** newsletter. We always need good submissions of articles, information, and photographs to include in each issue. That's what makes it interesting for the readers. So if you have an idea, some thoughts, or perhaps some photos of your shack or

some event you participated in, send them on in and share them with everyone!

You can send things in via e-mail to k1kgg@verizon.net or snail mail to:
Mark Bolls
61 Rockland Ave.
Malden, MA 02148

Text should be plain text (ascii) like an e-mail message, or in Microsoft Word format. Photos should be in JPEG or GIF format.

MEMBERSHIP PAYS!

**JOIN W.A.R.A.
TODAY!**

A Good Tuner Doesn't Have to be Pretty,

*by Joe Hutcheson,
KB1CJ@ARRL.net*

Believe it or not, the picture accompanying this article contains the best antenna tuner I've ever owned. No, it's not packaged in a nice box with printed labels on the face panel -- OK, to be blunt, it's not even in a box, and, yes, those really are alligator clip leads snaking across my desk and a coax choke balun wound on a soda on the side.

Despite it's – ahem – informal presentation (shall we say early stage prototype?), it works like a charm with my 300 ohm fed G5RV (in an inverted vee configuration) and a rotating dipole I use for upper HF. Better yet, it is a balanced tuner, so shielding has not been a problem (good thing, since there is none in mine!) and no de-tuning from hands on the knobs. To understand why I would allow my junk box to take over my operating position in this manner, some background is in order.

I have long been a fan of non-resonant antennas fed with balanced feed line and a tuner. Balanced feed lines are cheap. For the non-purist (that would be me), 100 feet of the “high quality” 300 ohm line at Radio Shack runs for under \$20. More importantly, balanced line will tolerate large swings in SWR over a wide range of frequencies with small losses. What balanced line lacks in convenience compared to coax (avoiding nearby metal objects, etc.), it gains in flexibility for those of us who are too lazy to put up resonant systems for our many HF bands. Whether for skeletal slots, inverted vees, horizontal loops or rotating dipoles, I have found 300 or 450 ohm off-the-shelf feed line to be a great solution for balanced antennas. For the QRO guys, something a little more robust would be in order, but home brewing ladder line is definitely feasible.

All well and good, and all old news to our early twentieth century forebears (who

managed to work the world before coax came on the scene), but modern transceivers are like picky eaters, they hate variety in what they are fed. For the solid state finals in my transceiver, only a non-reactive 50 ohm load fed in an unbalanced configuration will do. That means coax with grounded shield, not balanced line. Insert a balun (balanced to unbalanced transformer or “choke”) and a tuner at the shack end of the antenna system, however, and the modern transceiver's load constraints are resolved.



Most commercial tuners, including the built-in units now offered with many amateur transceivers, are designed to operate in an unbalanced configuration. This requires use of coax (which does NOT handle large SWR swings well – take a look at <http://www.ocarc.ca/coax.htm>) or placement of the balun between the tuner and the balanced line. For years, that is exactly what I did, until it dawned on me that force feeding my 4-to-1 balun was probably generating as much heat as RF on some of the bands (baluns do not operate efficiently over a wide range of SWR). As frequently noted in the antenna literature, the solution is to place the balun on the transceiver side of the tuner. The catch is that this will

leave both lines “floating” above ground (as it should), so a balanced tuner is in order.

While balanced tuners are increasingly available from commercial suppliers (with much better tuning capacity than the Johnson Matchboxes of yore), home brew solutions are readily available, too. One of my all-time favorite tuner articles, “A *Balanced* Balanced Antenna Tuner,” was published in the February 1990 QST by Rick Measures, AG6K (available to ARRL members under transmatches/antenna tuners in the Technical Information Section at <http://www.arrl.org>). Rick has been kind enough to post a copy of his article's text, along with updated comments from 2003 and schematic information, at a public site -- <http://www.somis.org/bbat.html>, and offered me words of encouragement in my (to borrow his words) “thrifty” effort.

Basically, the tuner is a balanced “L” design, having a variable inductor on each side of the feed line, with a capacitor shunted between the two. For low impedance loads (e.g., short antenna for a given frequency) the capacitor shunts across the input (transceiver) side of the coils. For higher loads, just switch the capacitor to shunt across the output of the coils – dig up two variable inductors, a capacitor, some jumper cables or relays and you're good to go.

Finding old transmitting capacitors is as easy as the next hamfest or eBay. Heck,

if you really want to, you can just build the things. In the Second ARRL Compendium, in his article "Remotely Controlled Antenna Couple," Richard Plasencia, W0RPV, shows how to use picture frame glass, two sheets of aluminum (we're talking cheap cookie sheet material here), a wing nut and a no. 20 threaded rod to build a poor man's knock-off of a vacuum variable cap with a breakdown voltage exceeding 15,000 volts! AG6K's balanced tuner does not have quite such extreme demands for its capacitor, and I had some surplus transmitting variable caps on hand, so, in my case, a little dumpster diving in the junk box was all that was needed to find a couple of capacitors that could be swapped out to cover the different bands (the more refined solution, of course, being to switch in a fixed transmitting cap in parallel when needing more capacitance on the low bands).

Unfortunately, my junk box did not (yet) include any rotary inductors. While I toyed with the idea of building them, the need for decent roller contacts and the mechanical design was a bit more than I wanted to tackle. A couple of well-priced surplus units were quickly found online and ordered. They came in pieces without the usual housing, requiring me to reconstruct the units with Plexiglas and local hardware, but the all-important roller contact and coils were had for short change. Keeping the inductors tuning in tandem (remember, we're tuning in parallel) was easily

accomplished by following AG6K's suggestion of physically coupling one inductor end-to-end with the next, using some polyethylene tubing readily available at my local hardware store.

Frankly, now that I've built my "prototype," I'm not sure that roller inductors are always essential. With the shunt capacitor, I have found coil changes infrequent within a given band, and usually end up using less than half of the coils that I have. Some taps and a decent switch (or, if you like my prototype approach, some extra alligator clip leads) could well simplify the tuner, particularly if remote operation away from the shack is not a requirement.

Someday, I guess, I will get this thing into some sort of housing (even AG6K's prototype was built on a piece of plywood). Who knows, I might even throw in some real leads and a relay to switch the capacitor (and add a home-made W0RPV "booster" cap for the low bands, to boot). Since putting it together last winter, however, I've been having too much fun just using it to bother to rebuild. Who knows? Maybe the prototype will be the finished product?

For those interested in reading more about commercially available balanced tuners, the September 2004 QST has a great article in its "Short Takes" section – "A New Generation of Balanced Antenna Tuners," by Joel Hallas, W1ZR. He does a good job of looking under the

hood of these units, some of which do a far more elegant job than yours truly in bringing AG6K's design to fruition.

73, Joe, KB1CJ

PHI NEWSLETTER **STAFF**

Editor (outgoing): John Flood
KB1FQG

Editor (incoming): Mark Bolls
K1KGG

A New meeting Location!

We have selected the Waltham Public Library on Main St. as our new meeting place. In June, WARA donated a copy of the "The 2007 ARRL Handbook" to the Library as a small token of our appreciation for use of the "Trustees Room" for our monthly meetings for the past 15 months. The Trustees Room is a modern room with a large conference table (seating about 14 people) and additional chairs around the walls. It is ideal for our monthly meetings and is free for our use since we are a Waltham, not-for-profit organization. Thanks also go out to Bob Martinson, N1VQR for all of his work in helping us get this new meeting space.

As a reminder, meetings are the last Wednesday of the month at 7:00PM except for July and August when we take a summer break. This year, we will skip the October meeting, as it falls on Halloween.

W.A.R.A. OFFICERS

President – Richard Amirault,
N1JDU
V. President – John Flood
KB1FQG
Treasurer - Ann Weldon,
KA1PON
Clerk – Jim Finlay,
N1HCF

Waltham ARA “Boat People” on Field Day 2007

by W1MJ

WARA did not run its own Field Day effort this year, so club members interested in this annual emergency communication preparedness exercise and social event were left “homeless”. Several of us sought and received “refugee status” from the Billerica ARS / Mitre Bedford ARC (W1ON). Their leader, Adam, K1ADW, graciously welcomed us to join their FD operation at Mitre in Bedford, MA. One of the “refugees”, Jon, W1JP, coined the term “Waltham Boat People”.

Grateful for being taken in, the boat people made significant contributions to the operation. Carl, K1UZK and his son Eilif, KB1NYQ, took responsibility for the “Get on The Air” (GOTA) station. This station allowed non-hams and inexperienced hams to try their hand at HF contest-style operation. Ironically, Eilif, though licensed less than a year, has already gathered so much contesting experience that he was disqualified from operating the GOTA station.



Kyra, daughter of W1JP, and Alexander, son of N1HY, operate the GOTA station

But don't feel bad for Eilif. He got to operate the other HF and VHF stations, and actually made the most contacts of all operators at this FD – over 300! Jon, W1JP, was another big contributor, with over 200 QSOs.

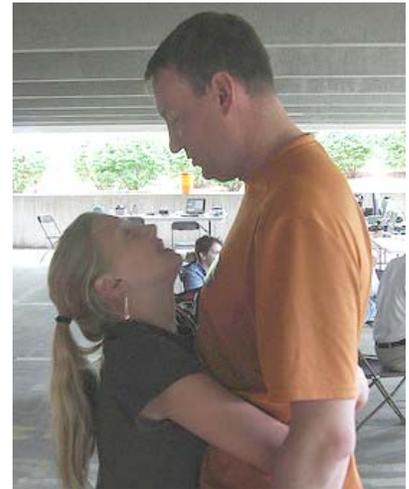


Eilif, KB1NYQ, operating CW with W1MJ's Begali “Italian Racing Paddle”

One of my highlights of FD '07 was to see that yes, no-code generals can indeed get interested in CW. Eilif got his feet wet by making a few CW QSOs on 6 meters, but by the end of FD, was “running” on 20 CW.



The Waltham Amateur Radio Association is affiliated with the A.R.R.L.



“Daddy, Daddy, I made almost 100 QSOs on the GOTA Station!” Kyra with dad, W1JP.

Field Day 2008

The prospect of Prospect Hill was a topic of discussion during our September meeting. The expectation of holding our own WARA sponsored Field Day in 2008 is in the works. We need to make preparations early and would encourage members to join our next meeting on Wednesday November 28th at 7pm. See you there!

ECHOLINK On the WARA Repeaters

The 146.64 machine is a wide area coverage machine located in Greater Boston and reaching most of the Eastern Massachusetts area.

We have added Echolink to the 64 machine. To connect from a computer anywhere in the world, use the K1UGM-L node ... 115244. For more info, see www.echolink.org.

WALTHAM AMATEUR RADIO ASSOCIATION

MEMBERSHIP FORM

The Waltham Amateur Radio Association operates repeaters on 2 Meters (04/64), 6 Meters, 220 MHz, 440 MHz, and 900 MHz. The repeaters are free and open for everyone to use. But repeaters have bills to pay, just as you do. A \$15 annual membership would help support these repeaters, as well as help to keep you informed about club activities and other aspects of ham radio. If you cannot afford \$15, please send what you can. If you are inclined to donate more, we will put it to good use. Please complete this form legibly, and return it to:

**Waltham Amateur Radio Association
Post Office Box 411
Waltham, MA 02454**

Name _____ Call Sign _____

Address _____

City _____ State _____ Zip _____

Telephone # __ (____) _____ Are you an ARRL member? _____

Email _____ Web Site Address (URL) _____

This year's donation enclosed (\$15 nominal): \$ _____

Check if you would like to get involved in any of the following Waltham ARA activities:

- | | |
|---|--|
| _____ Repeater Maintenance/ Construction | _____ Speaker for Club Meetings |
| _____ Public Service Activities | _____ Public Relations for W.A.R.A. |
| _____ Newsletter Writing or Production | _____ Photographer for W.A.R.A. events |
| _____ Contribute to the W.A.R.A. web site | |

Comments about the club, its repeaters, our web site or the newsletter?:

Visit the W.A.R.A. web site at: <http://www.wara64.org>

Waltham Amateur Radio Association
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